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With Which Is Combined

PAPER

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Government May Take Over Abitibi Canyon

Premier Henry, of Ontario, Canada, Assures Investors Inferentially That Province Will Continue Work On Big Power Project Until Development Is Completed—Resulting From Financial Difficulties of Ontario Power Service Co., Abitibi Subsidiary, Equitable Terms Are To Be Negotiated to Prevent Receivership

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., July 4, 1932—It was definitely decided this week and officially announced that the Ontario Government, or the Hydro-Electric system, is to take over, on equitable terms yet to be negotiated, the Abitibi Canyon power development project, as a result of the financial difficulties of the Ontario Power Service Corporation, a subsidiary of the Abitibi Power and Paper Company, which finds it impossible to secure some $5,000,000 necessary to complete the development. Faced July 1 with default in the payment of interest due on $20,000,000 worth of bonds, and faced therefore with shutting down the works, throwing 1,000 men out of employment, depriving Northern Ontario mines of their expected supply of cheap power, and confronting the alternative of a receivership the power development company appealed to the Government to find a solution.

Five weeks of negotiation culminated in the issuance of a statement by Premier Henry, after all night sittings of the Privy Council, in which investors are at least inferentially assured that the project will be taken over by the Government and brought to completion. The announcement, it is stated, virtually assures the workmen on the great dam against the immediate lay-off that was expected. It assures, also, it is felt, that the Ontario Hydro-Electric system will avoid in this case being forced to bid against any potential private corporate would-be competitor for the property. When the project was started the estimated cost was $23,000,000. It began as a subsidiary of Abitibi, at that time, with the rest of the news print industry, in a flourishing and confident position.

Wallpaper Firms Feel Depression

Canadian Wallpaper Manufacturers, formed within recent years as a merger, with English capital in control, is feeling the pinch of general business conditions and the sharp drop in building operations in the Dominion. The organization came into existence about five years ago and from the outset the British company has held a substantial interest in the undertaking. The union, it is stated, was justified by the fact that Canada was the only part of the British Empire outside England where wall papers were made. Economy and the avoidance of overlapping promised substantial mutual advantage. On the common stock, dividends paid have been 3 per cent for 1927-28, followed by 6, 10 and 5 per cent. The idea of spectacular dividends was discouraged from the outset, but it will be seen that down to the past year the return to Canadian Wallpaper Manufacturers was satisfactory. Now for 1931-32 the Canadian company, owing to trade depression in the Dominion, has not done well enough to warrant declaration of a dividend. The balance forward, nevertheless, is reduced only to $302,200 from $307,600.

Mill Manager Wins Damage Suit

Said to be the largest award ever made for wrongful dismissal through a Canadian court, judgment by consent, and arrived at out of court, gives to Orville Moore, former general manager of the Hinde & Dauch Paper Company of Canada, with headquarters at Toronto, the sum of $34,000, including costs. Arrears of salary amounting to $12,500 and damage of $52,500 for alleged wrongful dismissal and breach of contract, brought Mr. Moore's claim to $65,000. In his statement of claim plaintiff alleged his reputation and business standing had been damaged. He had been in the service of the company for twenty years. The defendants, who contended that as a company they had no right to appoint plaintiff for five years in view of a by-law that fixed an annual appointment for the general managership, also alleged that the company had suffered damage by reason of plaintiff's negligence, incompetence and failure to induce proper sales and manufacturing efficiency. Counter claim for damages alleged to have been sustained by the company during Mr. Moore's tenure of office was set at $250,000.

Will Seek Preference on Pulp

Vancouver advices indicate that the pulp and paper industry in British Columbia is making several recommendations to the Empire Economic Conference which meets in Ottawa this summer. One of these is for a 20 per cent preference in British Empire markets and the other is for equalization of currency within the Empire. Competition of Swedish pulp, largely as the result of depreciation of currency in Sweden, has been an important factor in the recent depression in the pulp industry on the coast.

General News Print Merger Prospect Improves

Those Particularly Interested In Price Bros. & Co. Are Co-Operating Fully and Effectively With Bankers' Committee, According to Chairman E. W. Beatty—Basis for Huge Consolidation of Canadian Mills Gradually Being Worked Out

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 4, 1932—E. W. Beatty, K. C., president of the Canadian Pacific Railway, has issued a statement denying that the plans for the proposed reorganization of Price Bros. and Co., are prejudically affecting the activities of the Bankers' Committee now engaged in working out a basis for a general merger of news print companies in Canada. On the contrary, he declared that those particularly interested in Price Bros. are co-operating fully and effectively with the Committee.

Mr. Beatty is the chairman of the committee referred to, and his statement is of interest not only in regard to this phase of the question, but as indicating the present position in regard to the industry in general.

By-Laws Approved at Price Meeting

At a meeting in Quebec of common and preferred shareholders of Price Bros. & Co., Ltd., which is being reorganized by Lord Beaverbrook, approval was given to a revision of the by-laws reducing the number of directors from fifteen to nine.

It was also decided to permit the directors to meet in Quebec City, where the head office of the company is situated, or in Montreal, or at Kenogami, Que., the last-named place being the site of its mills.

A statement was made by Allan A. Aitken (brother of Lord Beaverbrook) new president of Price Bros., that any new bonds which might be sold would not rank ahead of those presently outstanding, except with the approval of holders of the then outstanding bonds. It was also stated there was no intention on the part of Lord Beaverbrook and his associates of tampering with interest payments on the outstanding bonds.

The revised by-laws fix the ending of the company's fiscal year on the last day of February in each year, the directors being left to fix the annual meeting on any date within four months of the ending of the fiscal year.

Donnacona Meeting This Month

A meeting of the holders of bonds of the Donnacona Paper Company, Ltd., is to be held in Montreal on July 25 to consider a plan for reorganization. The plan proposes that: the present common shareholders will receive one share for each 10 held. The present authorized share capital of Donnacona is 200,000 shares of no par value, of which 150,000 shares have been issued and are outstanding. The present issued shares will be reduced to 15,000 shares, leaving 50,000 unissued, after which the capital stock will consist of 65,000 shares, which will be increased to 244,892 shares, divided into 121,804 Class "A" shares and 123,088 Class "B."

The two classes of common stock will rank equally as regards dividends, but voting rights will be vested with the Class "A" shares until specified obligations to senior securities have been fulfilled. The present shareholders will receive Class "B" shares.

There are at present outstanding $4,000,000 principal amount of "A" debentures and $600,000 principal amount of "B" debentures which were issued to Price Bros. & Co., Ltd., in payment of advances made by them to the company. Price Bros. & Co., Ltd., have an unsecured claim against the company aggregating approximately $804,393, and the Price company has agreed to have this claim dealt with on the same basis as the debentures, making the total amount of debentures and the claim $5,404,393. For this amount, 108,088 shares of Class "B" common will be issued; 92,000 shares to the holders of "A" and "B" debentures, being at the rate of two shares for each $100 principal amount of debentures and 16,088 shares to Price Bros. & Co., Ltd., for the unsecured claim, at the rate of two shares for each $100 of the amount.

The bondholders are to receive 121,804 Class "A" shares at the rate of 18½ shares for each $1,000 principal amount in consideration of the concessions asked. There is presently outstanding $6,584,000 of the 5½ per cent first mortgage sinking fund gold bonds due February 1, 1948. The bondholders are asked to waive existing defaults, and agree to the cancellation of two years' interest on the bonds and change in the company's obligation to pay the next ensuing two years' interest, that is, between August, 1934, and February, 1936, from net income only.

Changes are to be made in the company's contract with Shawinigan Water and Power Company, and, in consideration of concessions from Shawinigan, certain distribution systems and franchises will be conveyed to Shawinigan.

Boston Paper Trade Happenings

BOSTON, Mass,, July 5, 1932—The Andrews Paper Company reports that notwithstanding general conditions the demand for Menssana sheepskin parchment and artificial parchments for diploma makers has been far in excess of that of previous years. The leather diploma covers, which have been popular in the West, are fast meeting with favor in the East. The company has been receiving orders for them from all parts of the country.

The Holyoke Card and Paper Company has added black to the present range of colors in Kroydon Cover. Storrs & Bement Company is to stock black in medium weight and sizes 20 x 26 and 23 x 35.

Snap-Tite paper cans for ice cream and food products are being manufactured by special machinery made by the Russell Paper Can Company, Chelsea, Mass. The company, of which Harlow M. Russell is president, has a plant containing floor space of 72,000 square feet.

Nashwaak Pulp and Paper Mill Sold

ST. JOHN, N. B., July 4, 1932—Sale of the Nashwaak Pulp and Paper Company, Ltd., mill and real estate at Union Point, near here, to the Port Royal Pulp and Paper Company, Ltd., with head office at Quebec City, has been completed. It will be some months and perhaps not until 1933 before the manufacture of pulp at the mill will be resumed.

The purchase price was reported to be near $250,000, but the figures were not made public. A mortgage of $185,000 from the new owners to the Nashwaak company was made, it was learned.

The transaction does not include the extensive timber holdings of the Nashwaak company on the Nashwaak and Southwest Miramichi Rivers.

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removes 21% more water

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The Vickery Conditioned felt varied less than 25% in water removal during a run of eight days. *The hand-washed felt varied 60% and more between wash-ups.*

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Water Removed without the Conditioner

Water Removed with the Conditioner

For the complete report of the tests on which these charts are based, see the Bird Stuff Box for February. Or write.

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VICKERY FELT CONDITIONER

5371

Northern Mills Purchase Syl-Mac Company

Judson G. Rosebush, Vice-President of Northern Paper Mills, Announces That Merrill Plant Will Be Discontinued and Future Operations Will Be Maintained At Green Bay—Sale Includes Formulas of Sylvester H. Kilishek for Waterproofing

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., July 5, 1932—Addition of a new line of products is expected to be the outcome of a deal completed last week between the Northern Paper Mills, Green Bay, Wis., and the Syl-Mac Paper Products Company. The latter company was sold to the Northern Mills, Inc., the Research Laboratory Division of the Northern Paper Mills. With the sales goes the formulas developed by Sylvester H. Kilishek for the waterproofing of paper by a process that has attracted considerable attention in the paper industry. Mr. Kilishek has also been made a director of the Northern Mills, Inc.

A method of waterproofing was developed that would permit of the treatment of paper to make it suitable for container and barrel linings, table tops, floor coverings, draperies and other purposes. The waterproofing was a thin film of chemical treatment making ordinary grades of paper highly resistant to hot water, acids and chemicals; a preparation that would not penetrate throught the paper itself.

Mr. Kilishek established the Syl-Mac Paper Products Company at Merrill, Wis., several months ago and began developing a line of products, using paper largely from the Northern mills. Production was largely experimental, but it proved the possibilities of a varied line of products. The Merrill plant will be discontinued and all operations will be at the Northern Paper Mills, Green Bay, according to Judson G. Rosebush, vice-president and general manager. Mr. Kilishek accidentally discovered the process while attempting to make gaskets resistant to steam while engaged in engineering work.

Kimberly-Clark Adopts Five-Day Week

A five-day week for salaried employees was put into effect by the Kimberly-Clark Corporation, Neenah, Wis., on July 1. Hereafter they will not work on Saturdays. Coincident with the reduction in working time, the compensation of salaried employees has been cut 15 per cent. The change was made due to shortened work schedules of the Kimberly-Clark mills.

New Freight Law Challeneged

The Nekoosa-Edwards Paper Company, the Marathon Paper Mills Company, and the Mosinee Paper Mills Company, have filed suits before Judge A. G. Zimmerman in circuit court at Madison, Wis., challenging the validity of the new state law which forbids railroads to pay industries for doing their own switching in connection with freight movements.

Theodore Brazeau, Wisconsin Rapids, and Philip H. Porter, Madison, attorneys for the mills, charge that the statute, enacted last year, is unreasonable interference with interstate commerce, impairs the obligations of contract, and denies the companies liberty and property without due process of law. The Wisconsin Public Service Commission is the defendant in the action.

Pulpwood Movement Declines

Less pulpwood than formerly will be rafted across Lake Superior this season by the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis. The Newaygo Tug Line, owned by the mill, will start for Black Sturgeon Bay, Canada, about July 10, to bring across the first raft. Only two, of 8,000 cords each, will be brought across to Ashland, Wis., for reloading on freight cars.

Forestry efforts of the Nekoosa-Edwards Paper Company, Nekoosa, Wis., were explained by George Kilp, head forester of the company, in an address before the Kiwanis Club, of Wisconsin Rapids, Wis., recently. He said his company uses 230,000 cords of wood a year and for this reason must do all it can to promote reforestation enterprises. The company's foresters plant and take care of 3,000 acres of seedlings a year. It has been computed that one cord of wood on the average is grown on each acre of land, and that there is a 4 per cent return on the investment. He praised the efforts of the Consolidated Water Power and Paper Company along this line, saying the company's nursery at Biron, Wis., has now 1,000,000 seedlings in the process of growth. With land at $1.25 an acre, Mr. Kilp urged the Kiwanis Club to start a small nursery of its own.

Seasonal Activity in Indianapolis

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., July 5, 1932—Seasonal merchandise seems to be getting all the call here. Now that June is past, there will be a slump in those grades used for June weddings. At that the demand has not been as great as average for the fact that there were not as many weddings and the need for less expense affected the demand. However, it was a fair season.

The advance sales of picnic specialties for the holiday picnics was good. Items as paper plates, napkins, cups and the like seemed to be about the same as last year. Dealers bought only for immediate consumption and the remainder of the hot weather season should see a steady flow of orders. The orders will be for smaller amounts, but they will be numerous enough to create a fair volume.

Building papers continue to sell a trifle more readily than had been expected. There are no large orders, but the general activity in view of conditions, means that the central part of Indiana is seeing some construction. Prices are unsteady and dealers' stocks are being kept as low as is consistent with safety.

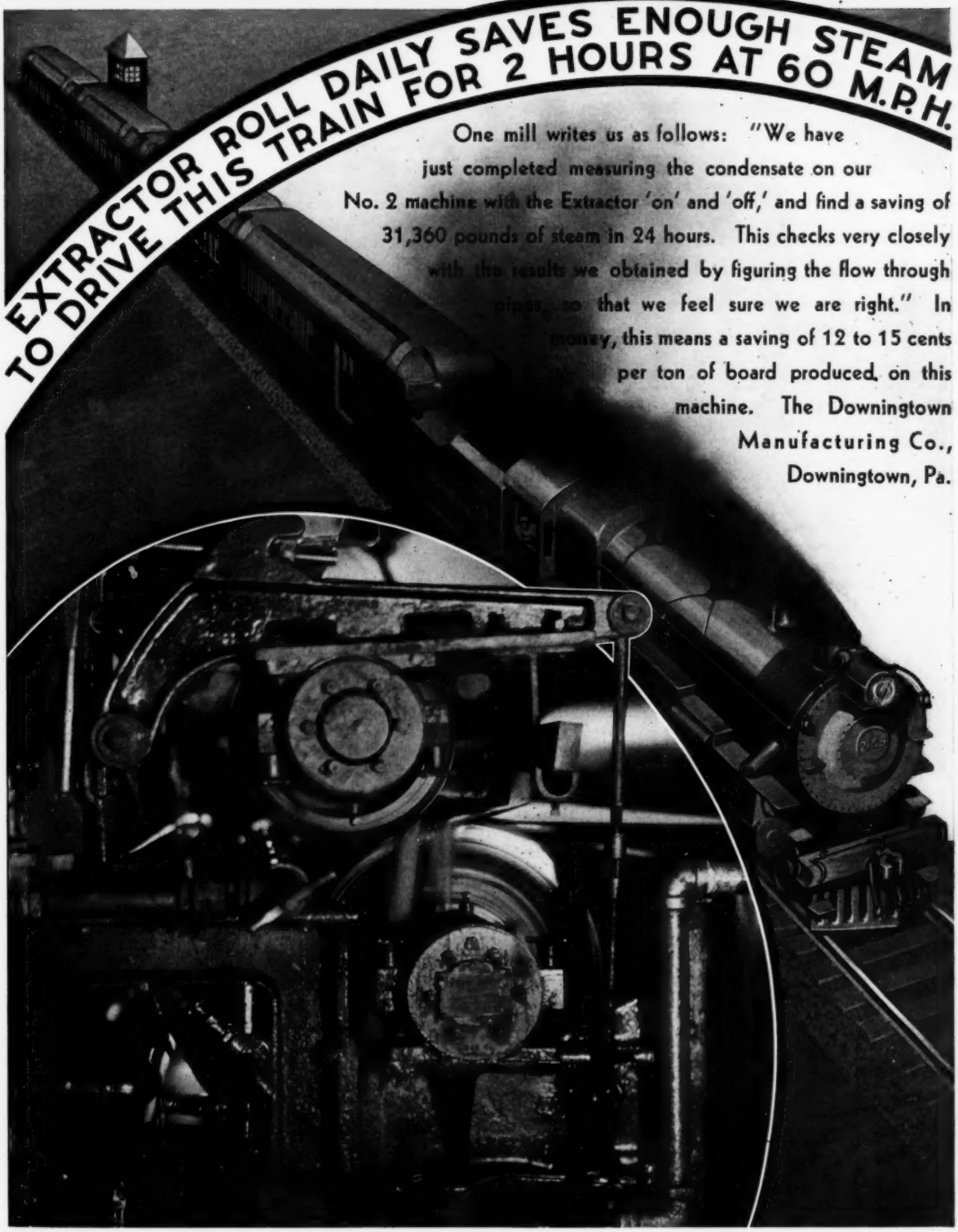
The container market continues in fair shape. Demand is somewhat spotted, various factories reporting a good volume and others apparently not so well fixed. Producers of strawboard are working only a fraction of the time and report indifferent demand.

With the exception of building papers and summer specialties, the trade is not expecting much during the summer months, which always are dull. Dealers in fine papers will be glad when the vacation season is over.

Demand for waxed papers, particularly for the bakery trade, continues good. Indiana factories are enjoying a good business and have for months. The demand from candy makers is a trifle better than it was some weeks ago, but could be improved upon more.

The paper stock market continues in a bad way. Prices are very low and demand from the mills is slow.

DOWNINGTOWN


EXTRACTOR ROLL DAILY SAVES ENOUGH STEAM TO DRIVE THIS TRAIN FOR 2 HOURS AT 60 M.P.H.
One mill writes us as follows: "We have just completed measuring the condensate on our No. 2 machine with the Extractor 'on' and 'off,' and find a saving of 31,360 pounds of steam in 24 hours. This checks very closely with the results we obtained by figuring the flow through pipes, so that we feel sure we are right." In money, this means a saving of 12 to 15 cents per ton of board produced on this machine. The Downingtown Manufacturing Co., Downingtown, Pa.

Philadelphia Paper Market Continues Spotty

Despite Dull Trend, However, Quotations Are Generally Steady to Firm In Both Fine and Coarse Paper Divisions—Manufacturers Are Operating On Half-Weekly Schedules In Majority of Plants—Paper Stock Drifting Along

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., July 5, 1932—Paper trading continued spotty, with little price disturbance, despite the duller trend. The most optimistic attitude in the situation is the firmness of standard grades of papers in both fine and wrapping paper divisions. Dealers do not look forward to greater activity until the early Fall, and are biding time until the turn is evident. Paper mills in the local territory are on half weekly schedules in the majority of manufacturing plants and are not planning greater schedules of operation until late summer or early Fall. Paper stocks and rags are drifting along with many inquiries from manufacturers but little actual buying.

Keickhefer Container Corp. Strike Settled

With the settlement of the strike in the mills and plant of the Keickhefer Container Corporation, at Delair, N. J., near Camden, the operations of both the container divisions and the corrugated and board mills were resumed. The plant was shut down for several weeks following a strike by workers on the cut in wages of an additional 10 per cent, following other cuts in the first months of the year.

Paper Trade Golf Tournament

The 16th Annual Golf Match of the Paper, Printing, and Publishing Trades was held at the Aronimink Golf Club, Newton Square, on June 28. The tournament was held in the afternoon with the trade made into foursomes of their own selection or in groups sponsored by the committee. The trophy most sought was that captured by Howard A. Berry, who was awarded the Paper Trade Golf Cup. Mr. Berry, and William A. Hentz, of the D. L. Ward Company, fine paper dealers, with their scores of 80 and handicap of 8, and 102 and handicap of 28 respectively were winners of low net. Mr. Berry was winner of the first prize, while Mr. Hentz came in for second, their scores being 72 and 74. Charles Wainwright won first prize in the Kickers Handicap, with Howard Satterthewaite, of the Satterthewaite-Cobaugh Company, fine paper dealers, a close second prize winner. The committee on arrangements was Irwin F. Magargee, Curis & Bros. paper mills, Newark, Del., Arthur B. Sherrill, paper mill agent; and Hal T. Soresen, Beck Engraving Company.

Jobbers Hear Chester A. Spaulding

When the Philadelphia Paper Jobbers Association met at the Elks Club last Tuesday they were given an elucidating talk on trade conditions by Chester A. Spaulding, assistant secretary of the National Paper Trade Association, who was a guest speaker to the organization. Secretary Spaulding emphasized the need of confidence as an essential factor in holding any organization together and stressed the elimination of harmful practices in business with the co-operation of the members. He told of the campaign the National Association is conducting for constructive co-operation of the mill men and distributors. He stated he had been making the rounds of various sections of the country and found the present dull trend a general condition but advised that betterment was not far distant. He expressed his impressions of the meeting of the local jobbers group and congratulated them on their attendance and the good work that was being carried on. He spoke of the Credit Interchange and stressed this phase of association effort as an important function of the organization.

Charles Resnick, chairman of the Credit Interchange Committee, spoke on Credit Interchange and the introduction of a system that will meet the needs of the jobbers. The Committee has adopted a plan which will be shortly introduced. With the unanimous approval of the members the system that has been approved will be formally inaugurated at the next meeting. With the closing of the session, the Philadelphia Paper Jobbers Association will be placed on summer schedule. Throughout July and August there will be held monthly instead of semi-monthly meetings, dates to be announced later. Another event that is scheduled for the Paper Jobbers Association is an outing, the committee to arrange for which is Lewis Gerber, Enterprise Paper Company, chairman; Samuel Feldman, Enterprise Company; Samuel Krepow, Russell Jeffers, Witte Paper Company; and George Hunter; Basler Paper Company.

Paper and Cordage Association Outing

With a well rounded representation of mill agents and wholesalers of paper attending the annual outing of the Philadelphia Paper and Cordage Association, held at the Baederwood Country Club, on June 29, the group enjoyed a social occasion that will long be remembered for its diversified program and spirit of camaraderie. First prize for the low gross went to C. Bancroft, of C. Moore & Co., while Harold Newell, of the American Manufacturing Company, won the second prize. The visitors prize went to Jack Murray, who was a guest of Mr. Newell. At the luncheon hour a word of greeting was extended the diners by President Stanleigh C. Brower, who opened the informal program.

J. L. N. Smythe Co. Holds Picnic

The employees and officials of the J. L. N. Smythe Company were guests of the officers at an outing held in Chestnut Hill last Saturday. The group joined in the many novelty sport events, including baseball, novelty races, quoits and tennis. The most interesting feature that followed the luncheon was the baseball game between the sales and inside staffs with the nine lined up in groups that represented the products sold by the firm. The winners were the Kleen Sweep, with W. C. Haines, captain; and the Chase-em and Bag-em, in honor of Chase Bag Company and its products, captained by Hilliard Smith, the former making a score of 19 to 6.

St. Regis Mill at Deferiet Resumes

DEFERIET, N. Y., July 5, 1932—The local branch of the St. Regis Paper Company resumed operations Tuesday after being shut down for several days. It was announced that a schedule of from four to five days weekly would be observed for an indefinite period. Curtailed schedules were also in effect prior to the suspension of operations. The mill is regarded as the principal industry here and furnishes work to many residents.

Better drying for manufacturers of Wrapping, News, Bond, Tissues!

ROSS Grewin VAPOR ABSORPTION

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DRIES MORE EVENLY ACROSS THE SHEET

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Liquid Latex and the Paper Industry

By George D. Kratz

Liquid latex attracted considerable attention several years ago when its use in the manufacture of paper was first suggested. Latterly, however, comparatively little has been said or written upon the subject and most of the information now available is found in the patent files. Several rather widely different influences seem to have combined to bring about this situation. Too hasty attempts to apply early discoveries, the natural reticence of manufacturers to disclose their processes, and lack of understanding in the application of latex for the purpose intended, have all contributed in retarding its use.

Its Uses in the Paper Field

Broadly speaking, the use of latex with paper may be divided into three general classifications, (a) incorporation with the pulp while in the beater, (b) the surface coating of sheet stocks, and (c) the impregnation of sheet stocks.

The first mentioned has been made the subject of a number of patents. One of the early patents which is typical of the process involved is that of Frederick Kaye[1]. Briefly, the method described consists in beating the pulp to the extent required to produce the desired type of paper. The latex, greatly diluted, is then added and thoroughly mixed with the pulp. A coagulating agent for latex, such as acetic acid, is then added, the contents of the beater transferred to cisterns, and the material run thru the paper making machine in the regular way.

Paper prepared by the above process was said to be remarkably strong in tensile strength, have high resistance to abrasion and to be able to withstand repeated bending while under tension. The possibility of the use of lower grade fibers was also pointed out. Improved texture and greater uniformity when viewed by transmitted light were also mentioned.

Wide Spread Interest Aroused

Naturally, such claims provoked wide spread interest and later Merle B. Shaw with C. W. Bicking[2] and F. T. Carson[3] published two papers on work done at the Bureau of Standards with paper prepared under the above described procedure.

The conclusions drawn from this work were that in the case of a book paper an increase in the bursting strength was indicated but variations in other qualities were within the limits of experimental error. Probably, the most discouraging factor was found in the poor ageing qualities of paper prepared by this method due to the resinification of the incorporated rubber. This was particularly true of sulphite and soda pulps.

Contradictory as it may seem, such results should not be construed to condemn the use of latex in paper manufacture. Rather, they should be regarded as constituting an important contribution to a clearer understanding of the subject and its ultimate solution. Rubber, particularly when in thin films, shows a tendency to oxidize or resinify with ultimate perishing. In the process just described, only ½ per cent to 2 per cent latex on the pulp is usually recommended. Thus if it is assumed that a uniform distribution of the latex is obtained throughout the mass, the rubber is deposited in an exceedingly thin film or constitutes an almost nebulous network when the pulp is sheeted. Under such conditions, the tendency to resinify or perish will be very great. Undoubtedly, great improvements have and will be made in beater processes for incorporating latex in the pulp, particularly if they permit the use of larger percentages of latex. The recent developments in rubber anti-oxidants may be of particular interest in this connection.

Coating and Impregnating

At the present time, what appears to offer one of the greatest opportunities for the use of latex in the paper industry is found in the coating and impregnation of sheeted stocks. Further, many of such applications can be carried on using standard type paper machines and do not involve the purchase of new equipment.

For example, a waterproof or water resistant coating of compounded latex solution can be readily applied to kraft paper with a standard type waxing machine. It dries readily and requires but little heat. One gallon of compounded latex solution applied in the above manner was found recently to cover well over 1,000 square feet of paper at a materials cost of less then 30 cents. In this instance, the chief characteristic desired was increased density. When tested on the densometer one sample showed an increase from 75 seconds to 40 minutes. Another sample similarly treated but of higher original density showed an increase from 4½ minutes to 144 hours. Still different effects of latex coatings have been described many years ago by F. Kaye.

Surface coatings of the above type may vary in thickness from thin films to readily measurable dimensions. Even in the case of thin films, however, the nature of the process is such that it permits compounding the latex with fillers, preservatives and antioxidants. Satisfactory ageing qualities are obtainable in many instances.

Should Find a Variety of Uses

Latex coated paper should find a variety of uses. In the bag field, it appears well suited for the manufacture of bags and sacks for such materials as cement, carbon black, calcium chloride and other substances of a similar character. It would be well adapted for use in the manufacture of paper raincoats, umbrellas, windbreakers; in fact for any purpose where either water resistance or high density is essential.

In the foregoing remarks on latex coatings it is assumed that the original density of the paper is such that the effect obtained is practically all on or near the surface. Impregnation is required only to the extent of penetrating the paper sufficiently to hold the surface film. Many other types of paper, however, can be readily penetrated by compounded latex solutions and a thorough impregnation obtained. Advantage of this quality in latex solutions is now employed extensively in the manufacture of artificial leather and productions of similar character.

Absorbent papers impregnated with compounded latex solutions have been on the market for some time, particularly for use in the shoe trade. Inner sole and sock-lining stocks are among the best known and most widely used products. Materials of this type are readily calendered and embossed for use as book and pamphlet covers. Artificial leathers for upholstery purposes are well within the bounds of possibility particularly if a composite mate-

[1] Brit. Pat. No. 17252/20—167935 August 25, 1921.
[2] Paper Trade Journal, Dec. 28, 1922—pg. 53.
[3] India Rubber World, June, 1923, page 561-562.
Bull. of R.G.A.—Vol. 4, No. 9, Sept., 1922, 408-418.

Note the *Bottom* Blade Mounting » »

—IT'S DIFFERENT

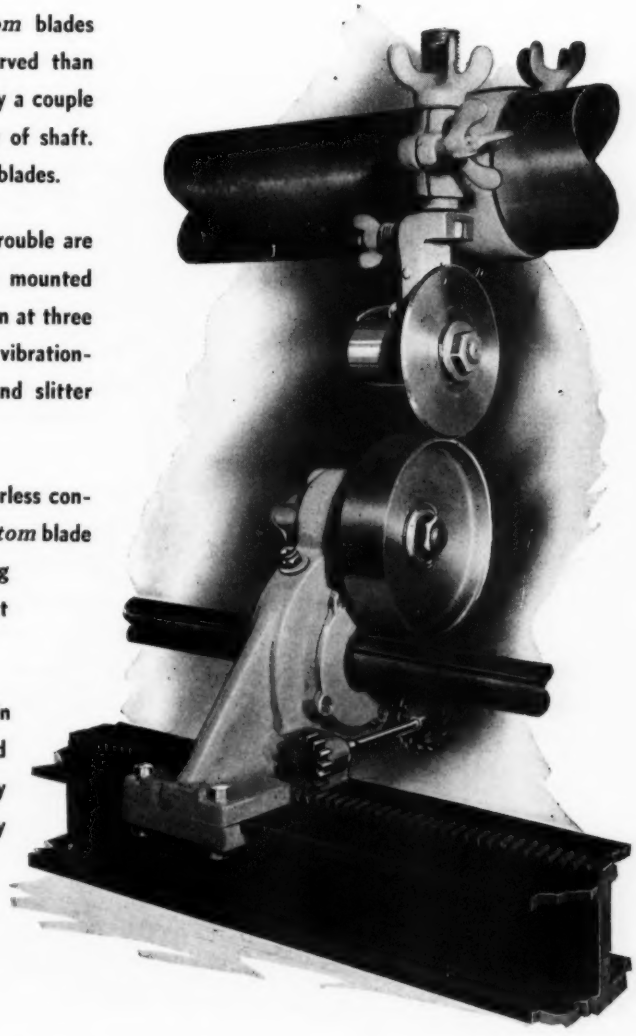
ACCESSIBLE for YOUR CONVENIENCE

Under the usual arrangement of mounting *bottom* blades directly on shaft, a dull blade is more easily observed than cured. It is necessary to dismount shaft, and possibly a couple of blades, to replace a dull or nicked blade midway of shaft. Hence the tendency to postpone regrinding bottom blades.

In "M & W" Ball Bearing Slitters, these causes of trouble are avoided. The *bottom* blades, instead of being mounted directly on shaft, are mounted above it and gear-driven at three times shaft speed. This permits using slow-running, vibrationless shaft. Both drive shaft (which is splined) and slitter spindles run in annular ball bearings.

This gives a true-running, almost frictionless and wearless condition with minimum need for lubrication. Any *bottom* blade can be replaced in a moment or so, without disturbing shaft or any other blade, merely by undoing end nut holding it on its shaft.

To complete the improvement, top blades also run in ball bearings. Thus the chance of frictional drag, and of wabble due to worn bearings, is eliminated. Any top blade is replaced, like any *bottom* blade, by removing one nut.



- SAVES CLAIMS FROM PRINTERS DUE TO DUST AND BAD EDGES.
- PREVENTS BLADE WABBLE THUS ELIMINATING SLITTER CRACKS.

Easy Blade Removal

Off and on in a Jiffy . . . Just undo the Nut

THE MOORE & WHITE COMPANY

Paper Mill Machinery

FIFTEENTH ST. AND LEHIGH AVE. PHILADELPHIA, PA.

rial of paper pulp and a textile are employed together. Even heavier products suitable for floor coverings have been under investigation for some time.

In addition to its application in the manufacture of paper stock latex has an unlimited number of applications in the manufacture of paper products and specialties. Its qualities and values as a paper adhesive are well known. It may be colored at will for use in water resistant advertising displays and paper novelties. As a water solution of rubber, it involves no fire risk and can be used in any type of building. This property alone has caused many manufacturers who have hitherto applied coatings in highly volatile or inflammable solvents to attempt substitution wherever possible. The equipment required for its application is in most instances remarkably simple. In the present market it is readily obtainable and is surprisingly cheap when properly compounded with other materials.

Liquid latex already has a distinct place in the paper industry. As its properties and applications become better understood, its utility will be increased many fold. The extended use of latex by the paper industry appears to offer one of the best mediums for new products and consequently new markets, that can be foreseen at this time.

Boston Paper Market Fairly Active

BOSTON, Mass., July 4, 1932—The volume of sales of paper in and around the Hub, as for a considerable period, has held fair in most cases. In a few instances, jobbers have sold more than expected in the last week, particularly in view of the advent of the summer season. In some quarters, the demand for papers for engraving, such as parchments for diplomas, has been decidedly satisfactory. Orders for bonds and ledgers are being placed in average volume. A certain amount of direct mail advertising is under preparation much of the time, calling for material. Box papers are moving in fairly satisfactory amounts.

Wrapping paper and paper specialties for shore resorts, parks and other recreational purposes continue to move in seasonal amounts, although possibly somewhat smaller than usual. Statements from the box board trade indicate more activity. Some feel that from now on, the tendency will be upward in volume of sales and that prices will be firm and possibly higher. Many board mills shut down for about ten days, to resume operations July 11.

Dullness prevails in paper stock. Most values remain at the same levels, although white blank news is now quotable at 1.10 @ 1.20, f.o.b. Boston, compared with a former range of 1.20 @ 1.30, and scrap sisal at .60 @ .75, compared with .75 @ .85.

River Raisin Paper Co. Changes

The following changes have been made in Sales Division of the River Raisin Paper Company, effective July 1, 1932:

Thomas E. Hollingsworth, formerly in charge of the Syracuse office, is taking over the Chicago office, succeeding W. A. Rehfield, resigned. He will be assisted by George W. Holland, formerly in charge of the Order Division of the Corrugated Department at the main office in Monroe.

J. M. Birks, formerly associated with Mr. Hollingsworth in the Syracuse office, is being placed in charge of that office.

All three of these gentlemen have been connected with the company for several years.

The Chicago Office is located at 208 West Washington Street, and the Syracuse Office at 167 Fage Avenue.

New York Trade Jottings

Contract has been awarded the Eugene Dietzgen Company, Inc., of 218 East 23rd street, New York City, for 150 rolls of blue print paper at $1.83, to use in the armory at Springfield, Mass.

* * *

H. L. Watson, of the Seminole Paper Corporation, Chicago, Ill., a division of the International Paper Company, is spending several days in New York City. He announces that his organization is in the midst of a strenuous campaign to put over Seminole Tissue in the New York market.

* * *

Paul Joseph White, formerly with Gatti Paper Stock Corporation, announces the formation of the Great Eastern Packing and Paper Stock Corporation, with which he will be connected as president. The office of the company is in the Postum Building, 250 Park avenue, New York City.

* * *

At a recent meeting of the Binders Board Manufacturers Association, it was voted to accept the resignation of Major O. M. Porter as secretary. It was also decided to move the headquarters of the association from 122 East 42nd street to the offices of the American Paper and Pulp Association at 370 Lexington avenue, New York. The officers of the association are William Foulds, Jr., president; C. L. Lloyd, secretary, and Arthur B. Goodrich, treasurer.

* * *

James Flett, leading Chicago paper stock dealer, has acquired from the Industrial Products Corporation, of 535 Fifth Avenue, New York, the sole rights to sell to paper mills, licenses for a new and cheap method of taking carbon printing ink, either black or colors or other inks, on or in a sheet of paper out of or off same. The process uses the same paper mill equipment now in use, starting with the paper mill beater. The costs of de-inking are approximately $2 per ton of pulp produced. The new de-inking process has been perfected to the extent that a mixed run of paper, including newspaper, wrapping, book, etc., can be de-inked simultaneously. The process in no way deteriorates the stock, which may be repeatedly de-inked.

Algonquin Mill Gets Pulpwood

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., July 5, 1932—A cargo consisting of a large quantity of pulpwood for the Algonquin Paper Mills arrived here early this week from Canada and a large force of stevedores have been placed at work unloading. The consignment consisted of about 1,500 tons and was brought from the preserve maintained by the company in Quebec. A number of vessels have been chartered purposely to handle these shipments and others are expected to follow in the near future.

Hartford City Paper Co. Changes Charter

INDIANAPOLIS, Ind., July 5, 1932—Officials of the Hartford City Paper Company, Hartford City, Ind., have filed with the secretary of state here two amendments to the company's charter. One changes the capital stock from 2,500 shares of $100 par value a share, to a capital stock of $390,200, divided into 3,902 shares, of which 3,000 are common and 902 preferred, the latter to bear 6 per cent interest. The other change increases the number of directors from five to seven.

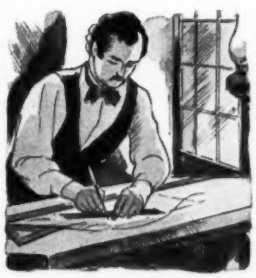
★

Days *cut to* Minutes

by

A PRINCIPLE *that has*

withstood the Tests *of a* Century



The year 1830 . . . a new theory . . . drawings made on pine boards, used, *then planed away* . . . patterns built under the flickering light shed by fish-oil lamps . . . castings brought in by ox team from 20 miles away . . . feverish activity . . . then, ready for the world, an invention used to this day . . . the first cylinder dryers. South Windham had cut paper drying time from days to minutes.

1932, with a specialized engineering staff, craftsmen skilled in paper machinery making, a modern factory of brick and steel, the latest production machinery, a complete foundry, the Smith & Winchester Manufacturing Company is still serving paper mills the world over—overcoming unusual machinery problems—supplying the finest paper mill equipment.

Use the experience of the Smith & Winchester Manufacturing Company to work with you on that next installation. Over a century of service to paper mills is at your call with no obligation—write South Windham.

MAKERS: *Fourdriniers, cylinder and wet machines; paper bag machines; undercut trimmers; Rainstorm shower pipes; slitters and calenders; reels and winders; rolls (bronze and wood); Jordans and Jordan fillings; stuff and fan pumps; castings from our own or customer's patterns.*

INVENTORS OF THE FIRST CYLINDER DRYERS FOR FOURDRINIER PAPER MACHINES

★

The SMITH & WINCHESTER

Manufacturing Company

PLANT AND OFFICES AT SOUTH WINDHAM, CONNECTICUT

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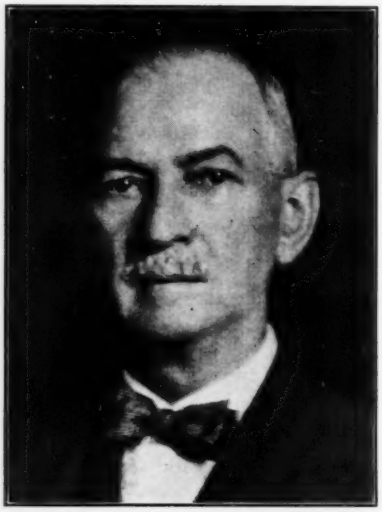
Obituary

[redacted]

Stephen A. Powell

Stephen A. Powell, widely and favorably known in the paper trade for a long number of years, died at the Champlain Valley Hospital, Plattsburgh, N. Y., June 24 after a short illness.

Mr. Powell was born in 1860 at Elizabeth, N. J. He was in the printing business for about twenty years. In 1899 he disposed of his interest in the firm of Willis McDonald & Co. The same year he formed the firm of Shaljian & Powell, pamphlet binders, from which he resigned in less than a year. In 1900 he represented the



STEPHEN A. POWELL

J. P. Jordan Paper Company of Boston and in 1901 started in the paper business at 28 Elm street, New York City. In 1903 he moved to larger quarters at 480 Pearl street and from there in 1906 to 7-9-11 Laight street. In 1910 he moved to 334-338 Hudson street for ten years and in 1920 to the present address, 20-22 Waverly Place, New York City.

Stephen A. Powell, Jr., Winter R. Higby and Burgess F. Morhous have been associated with him since he started in business in 1901.

The business will continue as usual.

Walter G. Higgins

Walter G. Higgins, who was connected with the sales division of the United Carbon Company, passed away at Caldwell, N. J., on Wednesday, June 22. Mr. Higgins was the son of William W. Higgins, who has been identified with the Carbon Black business for over thirty years and who is well and favorably known not only throughout the rubber, ink, paint trades but the paper and its allied trades as well.

Mr. Higgins started in the plants of the company and learned the business from the ground up, joining the sales force about three years ago. He received his education at Columbia and New York Universities and was for a period of time connected with the Standard Oil Company of New Jersey.

He is survived by his widow, one brother, his father and his mother.

Gets Compensation for Husband's Death

DAYTON, Ohio, June 28, 1932.—Judgment of a jury in the Common Pleas court of Butler county awarding state compensation in the suit of Elizabeth Fritz, who sued the Ohio Industrial Commission, was affirmed in an opinion issued by the Court of Appeals.

Mrs. Fritz had sought compensation in the death of her husband, Albert Fritz, who suffered fatal injuries June 6, 1928, while employed by the Black-Clawson Company of Hamilton. The jury here determined she was entitled to such compensation.

On the day in question Fritz was assisting in loading a freight car with machinery. He was on a keg, placing and blocking the machinery by driving spikes through boards and blocks on the car. Additional machinery was being brought to the car by the use of a crane, and was over Fritz when he was heard to fall from the keg. He died within a short time.

A physician testified that Fritz had enlargement of the arteries, due to heart trouble.

The only claim made by the State Industrial Commission was that there was no evidence that injury and death were due to Fritz's employment by the papermill machinery manufacturing concern.

"It was purely a question for the jury to decide" the Court of Appeals opinion reads. "The judgment is affirmed."

The opinion was written by Judge Wade Cushing, Judge Simon Ross and Judge Francis Hamilton, concurring.

Mrs. Fritz was represented by Attorney Harry S. Wonnell and the State Industrial Commission was represented by Attorney R. R. Surnehly, of the Attorney General's staff, and Zelmar G. Margenthaler, prosecutor of Butler county, Ohio.

United Container Association To Meet

The regular bi-monthly meeting of the United Container Association will be held at Briarcliff Lodge, Briarcliff Manor, Westchester County, N. Y., on Monday and Tuesday, July 11 and 12.

The Lodge will arrange for cars to meet regular trains arriving at Scarborough from 7 A.M. to 7 P.M. and other trains on special arrangement.

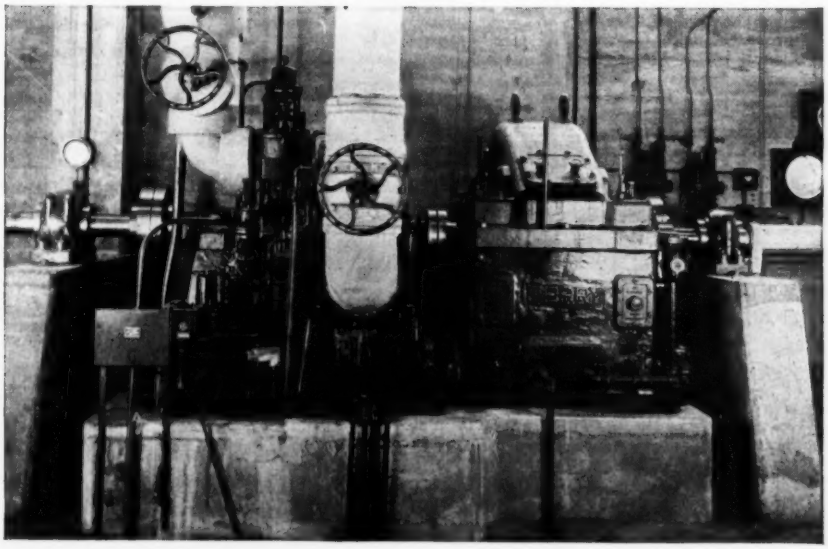
Committee meetings, of which a detailed schedule has been sent to all members, will be held on Monday, July 11 from 10 A. M. to 5 P. M. On Tuesday, July 12, in addition to the regular meeting of the executive committee and the general association meeting in the afternoon, there will be a luncheon of regular and associate members of the association. During this luncheon Norman F. Rehm of *Fiber Containers* will read a paper on "Supply and Demand in the Linerboard and Containers Markets." At the general association meeting from 2 P. M. to 5 P. M., Samuel Katz, president of the Gibraltar Corrugated Paper Company, Inc. will read a paper on "Cutting Container Costs."

American Writing Again Tenders Bullion

HOLYOKE, Mass., July 5, 1932—The American Writing Paper Co. Inc., Saturday tendered silver bullion in payment for their water rentals to the Holyoke Water Power Company or such part of them as is alleged to be stipulated for that kind of payment in the original indentures. The bullion was taken to the office of the Water Power Company and its payment formally refused by the Company. This is the third tender of silver bullion and the matter will probably be eventually threshed out in the courts.

TERRY

PAPER MACHINE DRIVE



400 HP Variable Speed Turbine Paper Machine Drive — Compact — Efficient — Dependable — Delivers Clean Exhaust Steam for Driving.

GIVES ANY DESIRED SPEED

Among the many advantages of the Terry Paper Machine Drive is its ability to give higher paper speeds. It thereby enables the operators to obtain a wider speed range.

It can be built to give any speed throughout a 10 to 1 range. Whatever speed is most suitable for the stock is immediately available. All speeds from minimum to maximum are secured without steps. Unusually accurate regulation is obtained at all settings.

Why not investigate the possibilities of one of these dependable units? No obligation.

The **TERRY** *Steam Turbine Co.*

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ILLS OF THE PAPER INDUSTRY

A steady rise in consumption during the post-war years, leading to intense "rationalization," including scientific management and mass production, together with the non-materialization of the expected ever-increasing consumption of stocks which has produced of late severe price-cutting, are factors largely responsible for the present adverse situation in the world's paper industry, according to a survey by B. M. Frost of the Commerce Department's paper division.

Between 1913 and 1927, the world's population was estimated to have increased only 10 per cent, while figures indicate that production of paper in the leading manufacturing countries during the years 1913 to 1929 increased at least 100 per cent, the survey shows.

Other important factors in the situation have been the desire of a number of countries to become self-sufficient in their paper requirements, and political disturbances in those less developed countries in the Far East and South America.

Consumption of paper throughout the world seems not to have declined, but continues at an approximately steady level, especially when it is borne in mind that a number of the larger leading countries, including the United Kingdom, France, and Russia, have added to their productive capacity and are supplying the demands of their home markets to an ever-increasing extent. A comparison of values during the years 1929 to 1931 indicates a general lowering of prices and a proportionately greater demand for cheaper grades of paper.

Canada has consistently maintained its position as the leading export country in the world during the past three years, followed by Sweden and Germany. There was some shifting in the relative positions of the other countries during this period, however. Norway was fourth in the years of 1929 and 1930, but dropped to fifth in 1931, giving way to Finland which was fifth in the former two years. The United Kingdom was sixth, in 1929, but dropped to seventh place in 1930 and 1931, giving place to the United States, which were seventh in 1929. Japan was consistently eighth in the three years.

Conditions in the international wood pulp market closely parallel those in the paper market, mill capacity in the leading producing countries being greatly in excess of present market requirements, plants in all countries have been closed down, or are running on part-time basis, while current market prices do not allow for a moderate profit. Between the years of 1920 and 1929, the aggregate capacity of the chemical pulp mills doubled, while that of the mechanical groundwood mills more than doubled.

A general slackening in the international wood pulp market manifested itself as early as the summer of 1929, and has continued up to the present. Orders which a few years ago were placed perhaps two years in advance, are now smaller and for immediate requirements. Exports tapered off during 1930 and were considerably under the 1929 level during last year.

PULPWOOD CONSUMPTION

The Bureau of the Census announces that, according to a preliminary tabulation of data collected at the annual canvass of pulp mills, the total quantity of pulpwood consumed by 120 mills in 1931 was 4,248,680 cords, a decrease of 11.6 per cent as compared with 4,808,080 cords consumed by the same mills in 1930 and of 15.3 per cent as compared with 5,013,986 cords consumed in 1929. The production of wood pulp by these mills in 1931 amounted to 2,842,615 tons, a decrease of 9.4 per cent as compared with 3,137,076 tons in 1930 and of 12.4 per cent as compared with 3,246,634 tons in 1929. These 120 mills accounted for 66.8 per cent of the total consumption of pulpwood and produced 67.7 per cent of the total output of wood pulp in the United States in 1930, as compared with 65.6 per cent of the pulpwood consumed and 66.7 per cent of the wood pulp produced in 1929. Assuming their proportionate consumption and production to have been approximately the same in 1931 as in 1930, an aggregate consumption of about 6,360,000 cords of pulpwood and an aggregate production of 4,199,000 tons of wood pulp during that year are indicated. The corresponding totals for 1930 were 7,195,524 cords of pulpwood and 4,630,308 tons of wood pulp, and for 1929, 7,645,011 cords and 4,862,885 tons, respectively.

The following statement compares the consumption of pulpwood and the production of wood pulp by 120 identical mills in 1931, 1930, and 1929. In this statement, which covers about 60 per cent of the total number of active mills, twenty-one States are represented. As soon as returns are received for the remaining mills, a report giving complete figures will be issued.

PULPWOOD CONSUMED AND WOOD PULP PRODUCED BY 120 IDENTICAL MILLS: 1931, 1930 AND 1929

	1931	1930	1929
Cords of pulpwood consumed.....	4,248,680	4,808,080	5,013,986
Tons of wood pulp produced.....	2,842,615	3,137,076	3,246,634

Canadian I. P. Reports Income

MONTREAL, Que., July 5, 1932—Canadian International Paper Company and subsidiary companies report that consolidated net revenue in 1931 available for interest and depreciation was $4,530,869, compared with $5,612,082 in 1930. The 1931 figure before depreciation was nearly three times interest requirements on all the company's first mortgage bonds and prior liens. The balance from operations available for surplus in 1931 was $755,900 against $1,337,526 in 1930.

Earnings of New Brunswick International Paper Company and International Power and Paper Company of Newfoundland, Limited, are not included in either the 1930 or 1931 earnings figures, as Canadian International Paper Company acquired those companies as of December 31, 1931. Their acquisition is reflected in the company's consolidated balance sheet as of December 31, 1931.

At the end of the year consolidated current assets amounted to $28,404,270, or well over three times consolidated current liabilities of $7,718,161. Included in the current liabilities are bank loans of Canadian International Paper Company amounting to $660,625 and bank loans of subsidiaries totaling $4,450,000. Not included in current liabilities are amounts due International Paper and other affiliated companies in the net amount of $465,873.

With the two mills of the recently acquired New Brunswick and Newfoundland companies, located, respectively, at Dalhousie, New Brunswick, and at Corner Brook, Newfoundland, and its own two mills at Gatineau and at Three Rivers, Quebec, Canadian International Paper Company is now the world's largest producers of news print paper. The combined average output of the four mills for each operating day during 1931 amounted to 2,517 tons and the potential daily output of the present paper machines is estimated at more than 2,800 tons. The average cost of production is said to be lower than any other group of mills under unified control in North America.

This acquisition places Canadian International Paper Company in control of all the important Canadian and Newfoundland pulp and paper properties in the International Paper group, including the group's largest and most modern news print mills. These mills have been able to maintain a relatively high rate of production during the recent period of declining consumption because of International Paper Company's policy of concentrating news print operations at its mills in Canada where operating costs are lower.

Comparative consolidated earnings statements are:

	Year 1931	Year 1930
Sales (net)	$25,493,739	$32,199,754
Profit on exchange	789,799	
Net revenue, including other income	4,530,869	5,612,082
Less:		
Interest on first mort. bonds and prior liens	1,531,499	1,561,239
Other interest, amort. of disc., etc.	1,126,910	1,185,441
Depreciation	1,116,560	1,527,876
Plus: Non-recurring items (net)		522,219
Balance added to surplus	755,900	1,859,745

These earnings do not include New Brunswick International Paper Company and International Power and Paper Company of Newfoundland, Limited, which were acquired as of December 31, 1931.

Restraining Order in Casein Case

WASHINGTON, D. C., July 5, 1932.—Judge J. Dickinson Letts of the Supreme Court of the District of Columbia has issued a temporary restraining order to prevent the U. S. Tariff Commission from forwarding its report of an investigation of the comparative costs of producing casein in the United States and the Argentine to the President under the terms of the flexible tariff provision of the Tariff Act. This order was issued upon the application of the National Cooperative Milk Producers' Federation.

Buy Western Quebec Paper Mills

MONTREAL, Que., July 5, 1932—The Western Quebec Paper Mills at St. Andrews East, Quebec, which have been closed for several years, have been purchased by the Canada Paper Company. The latter, it is understood, will begin making absorbent waddings, facial tissues and such other paper products as are not now manufactured in Canada.

The new owners have not yet decided whether to remodel and open the plant at St. Andrews East or to transfer the equipment to one of their other mills.

The Canada Paper Company is a subsidiary of Howard Smith Paper Mills, Ltd., one of the largest producers in Canada of fine papers. The chief plant is at Windsor Mills, Quebec.

I. P. Complains About Freight Rates

FORT EDWARD, N. Y., July 5, 1932—The International Paper Company, Ticonderoga Pulp and Paper Company and other concerns are among the complainants at a hearing being held this week before the Interstate Commerce Commission relative to freight rates. Violations of several sections of the Interstate Commerce Act is alleged in the original complaint which declares the arbitrary freight rates are unjust and excessive on branch lines of the Delaware & Hudson. The Northern New York Traffic Association has been leading the fight to secure revisions in existing schedules.

Union Bag Wins Legal Point

HUDSON, FALLS, N. Y., July 5, 1932—The Union Bag and Paper Company has won a legal point in its fight for a reduction on the assessment valuations of its property under a decision made this week by Supreme Court Justice Heffernan. The decision grants application for a writ of certiorari to review the valuations. The ruling marks the second occasion that a writ has been granted, the previous one having been declared void because Judge Rodgers was disqualified to issue it.

Reductions of about 35 per cent are sought. The property is assessed for $1,202,900 which the company claims to be excessive.

May Curtail News Print Production

WASHINGTON, D. C., July 6, 1932—An agreement for the curtailment of news print production in Norway, Sweden and Finland is under negotiation. The volume of production and shipments have been maintained at a relatively high level, but it is said that profits have been sacrificed and many companies are operating at a loss. Restrictive action is considered necessary before the end of the year and further disastrous price cutting avoided according to Acting Commercial Attache McLean at Oslo. The Norwegian and Swedish producers are reported as being favorably inclined.

Prices in Scandinavian Ground Wood

WASHINGTON, D. C., July 6, 1932—The price situation in the Scandinavian mechanical pulp field has suffered more than chemical pulp according to reports to the Department of Commerce. A contributing factor appears to have been the dissolution of the mechanical pulp cartel on April 1. It is reported also that stocks of both mechanical and chemical pulp have been reduced since the decrease in production in the Scandinavian countries has been greater than the decrease in exports.

Announcing

AMERICAN CYANAMID & CHEMICAL CORPORATION

Effective July 1st, 1932

IN ORDER to more effectively place at the disposal of its customers the combined technical, manufacturing, sales and shipping facilities of the Industrial Chemical and Insecticide units of the American Cyanamid Company and affiliated companies, American Cyanamid & Chemical Corporation have, as of July 1st, consolidated the activities formerly carried on by the following companies:

AMERICAN CYANAMID COMPANY
Industrial Chemical Division
AMERICAN CYANAMID SALES COMPANY
THE KALBFLEISCH CORPORATION
A. KLIPSTEIN & CO., INC.
JOHN C. WIARDA & CO., INC.
SUPERIOR CHEMICAL CO., INC.
FUMIGATORS SUPPLY COMPANY

All correspondence after July 1st should be addressed to American Cyanamid & Chemical Corporation at the same address to which you have been accustomed to send letters or other communications. In addition to the above, the activities of the following companies have at the same time been placed under the control of American Cyanamid & Chemical Corporation:

AMERICAN POWDER COMPANY
THE SELDEN COMPANY
STRUCTURAL GYPSUM CORPORATION
OWL FUMIGATING CORPORATION
THE KALBFLEISCH CORPORATION OF SURINAM

We believe that this consolidation of activities will enable us to render even better service to the trade, and look forward to the increased opportunity of continuing the established relationship with our friends and customers.

AMERICAN CYANAMID & CHEMICAL CORPORATION
535 FIFTH AVENUE, NEW YORK

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

The National Research Council, 21st and B Street, Washington, D. C., through Dr. Clarence J. West, extends the courtesy of its photostat service to members of the Technical Association of the Pulp and Paper Industry. Owing to a limitation of personnel and time, this service cannot be extended to non-members.

The charge for the photostat service is: 9 x 11 inches—18 cents per page, 18 x 11 inches—35 cents per page, 22 x 18 inches—70 cents per page, minimum charge, 50 cents.

Payment should be made upon receipt of invoice.

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Raw Materials

Paper Making Value of the Tow of the Banana Tree. F. Heim de Balsac. Bull. Agence Gen. Colonies 25: 252-257 (Feb. 1932).—Tow prepared by natives of the Ivory Coast from *Musa paradisiaca* L., on cooking 7 hrs., under a pressure of 3 kilos with a 5 per cent caustic soda solution, yielded 57.5 per cent air-dry pulp, which furnished sheets of high tensile strength and good tearing resistance. The tow, unbleached pulp and bleached pulp, respectively, had the following composition: moisture 13.40, 7.05, 7.01; ash on dry basis 7.00, 2.12, 0.40; fats and waxes on dry basis 0.30, 0.0; cellulose on dry basis 60.15, 94.20, 96.51; lignin (by difference) 32.55, 3.68, 3.09 per cent.—A.P.-C.

Water Solubility of Wood and Pulp. Paper Trade J. 94, No. 16: 41 (April 21, 1932).—A description of the tentative official T.A.P.P.I. method.—A. P.-C.

Non-Fibrous Raw Materials for Paper Making. Chlorine and Bleach. R. T. Baldwin. Paper Trade J. 94, No. 17:35-36 (April 28, 1932).—Casein. A. E. Regnier. Ibid 36. Clay and Fillers. C. H. Champion. Ibid 36. Dyes and pigments. J. C. Schmidt. Ibid 37. Lime and Limestone. O. L. Cook. Ibid 37-38. Pyrites. F. J. Curtis. Ibid 38. Rosin. E. J. Turner. Ibid 38. Rosin Size and Engine Sizing. A. C. Dreshfield. Ibid 38-39. Salt Cake. F. J. Curtis. Ibid 39. Sodium Aluminate. F. J. Curtis. Ibid 39. Starches. F. H. Knowlton. Ibid 39. Wax Sizes. R. W. Kumler Ibid 39-40 Limestone and Salt Cake on the Pacific Coast. W. Hirschkind. Ibid 40.—A brief outline of developments of technical and economic natures during 1931.—A. P.-C.

Cellulose and Lignin

Concerning the substitution of cobalt for copper in copper ethylene diamine cellulose solutions. Wilhelm Traube and Veronika Schenck Thiekotter. Cellulosechemie, 12, No. 12: 301-07 (Dec., 1931).—Metallic cobalt is used instead of copper in the decomposition of copper ethylene diamine cellulose solution and a solution of copper oxide ethylene diamine solution not containing cellulose. The following investigations were carried out. Displacement of the copper by cobalt from a cellulose cupric hydroxide solution and from the same solution without cellulose. The determination of the yield of the cellulose regenerated from the cobalt solution. Decrease of the viscosity of the cupric cellulose solution by treatment with cobalt under the exclusion of oxygen or access of air. The possibilities of the reduction of the cellulose used in the experiments.—J. F. O.

Chemistry of Lignin. VI. The Distillation of Alkali Lignin with Zinc Dust in an Atmosphere of Hydrogen. Max Phillips and M. J. Goss. J. Am. Chem. Soc. 54: 1518-1521 (April, 1932).—Distillation of alkali lignin (from corn cobs) with zinc dust in hydrogen at a maximum temperature of 400°C. yielded an oily distillate which was separated into: (1) a phenolic fraction containing guaiacol and 1-*n*-propyl-3-methoxy-4-hydroxybenzene and (2) a "neutral" fraction yielding anisic acid by oxidation with permanganate. The significance of these findings from the standpoint of the structure of lignin is briefly discussed.—A. P.-C.

Factors Affecting the Quantitative Determination of Lignin by 72% Sulphuric Acid Method. Geo. J. Ritter, R. M. Seborg and R. L. Mitchell. Ind. Eng. Chem. (Analyt. Edit.) 4:202-204 (April 15, 1932).—Owing to the discovery of additional factors that affect the quantitative determination of lignin in wood, the following modifications have been incorporated in the method used at the Forest Products Lab., Madison: (1) the residue after extraction with alcohol-benzene is extracted with hot water; (2) the concentrated acid-wood mixture is kept in a bath at 20° C.; (3) two hours are allowed for solution of the carbohydrates in the 72 per cent sulphuric acid; (4) the diluted mixture is hydrolyzed for 4 hrs.—A. P.-C.

Effect of Temperature on the Sulphuric Acid Method for Lignin. C. J. Peterson, A. W. Walde and R. M. Hixon. Ind. Eng. Chem. (Analyt. Edit.) 4:216-217 (April 15, 1932).—Increase in temperature, particularly above 15° C., results in higher results being obtained in the determination of lignin by the 72 per cent sulphuric acid method, the increase varying with the nature of the lignocellulosic materials analysed and being due to the carbonization of the material. It is recommended that the temperature used in the determination be standardized, preferably at about 4° C. which can be easily attained in the ice box.—A. P.-C.

Alkaline Processes

Investigation concerning the soda and sulphate pulp cooking process. Erik Hagglund and Richard Hedlund. Papier-Fabr. 30, No. 5:49-53; No. 6:61-65, (Jan. 31, Feb. 7, 1932). The experiments were carried out in autoclaves of 375 cubic centimeters content, which rotated in a bath of oil which would not vaporize at the temperatures necessary for the decomposition. The authors found that the yield of pulp is dependent less on the maximum temperature than on the content of sodium sulphide in the cooking liquor. The decomposition proceeds faster with sodium sulphide than with pure sodium liquor. The question, in which part of the spuce wood the most lignin is located, is discussed. In the range of 150 to 170° C., the maximum yield of pulp which can be defibered, is neither influenced by the content of sulphide nor the maximum temperature. In the range of 150 to 170° C., the lignin content of the pulp is not appreciably influenced by the change in maximum temperature, if the cooking is carried out to give the same yield. Increasing amounts of sodium sulphide in the white liquor improves the dissolving property of the white liquor for lignin. This property is not noticeable after the sulphide content exceeds 16 per cent of the total content of active alkali. A content of about 16 per cent of sodium sulphide in the white liquor increases the speed of decomposition almost as much as 7-8° rise in temperature; above 16 per cent there is no effect. Numerous curves, tables and illustrations accompany the article.—J. F. O.

Concerning the importance of the relation of alkali for the properties of kraft pulps from spruce and pine wood. Erik Hagglund and C. Nyman. Zellstoff Papier 12, No. 2:65-66, (February, 1932). Twenty per cent alkali was used in the small digester instead of 25.2 per cent, but then it was necessary to cook for a longer time in order to reach the same degree of decomposition and pine wood longer than spruce. Higher yield was obtained and also a stronger paper. Tearing length increased but the fold decreased with decreasing alkali in the cooking. Several tables accompany the article.—J. F. O.

Effect of Variables in the Soda Process. C. R. Mitchell, G. J. Potter and J. H. Ross. Pulp Paper Can 33:25, 46, 48, 50 (March, 1932).—Results are presented and discussed of a number of experimental cooks carried out at temperatures of 150° to 180° C. and alkali concentrations of 0 to 3 per cent for 4-hour digestion periods. Quality was gaged by the viscosity of a solution of the pulp in cuprammonium reagent. A balance must be reached in temperature and concentration conditions, so that defibration is complete and delignification is carried to the point where the final bleaching may be carried out on a pulp having a maximum viscosity.—A. P.-C.

Production of Clean Paper Pulp from Old Printed Paper. R. Weber. Brit. pat. 364,756 (Nov. 17, 1930)—The paper is treated with sludge obtained in the causticizing either of sodium carbonate or of ignited residues from the soda or sulphate pulp process, together with carnallite waste liquor, and the pulp obtained is subsequently washed. A. P.-C.

Production of Cellulosic Pulp from Low-Lignin Vegetable Materials. Elton R. Darling assignor to Cornstalks Products Co. U. S. pats. 1,845,487 and 1,845,488 (Feb. 16, 1932).—*No. 1,845,487*—Material of relatively low lignin and high pentosan content, such as cornstalks, etc., is shredded, cleansed and digested by heating under pressure with about 10 times its weight of water. The water is drawn off, heated and passed through the material again; the material is treated with a dilute sulphuric acid solution and the acid is removed from the mass. *No. 1, 845,488* relates to the alkaline digestion of materials such as cornstalks with fortifying of the digestion liquor during the progress of the digestion to maintain the strength of the solution substantially constant. Caustic soda solution of 1 per cent strength may be used.—A. P.-C.

Alkaline Pulping Process. George A. Richter assignor to The Brown Co. Can. pats. 319,444 and 319,447 (Feb. 2, 1932).—*No. 319, 444*—Chipped wood is steeped at about room temperature in a highly alkaline liquor until a large proportion of the encrustation has been dissolved. The chips are washed and treated with chlorine water, which reacts upon the ligneous and other coloring matter in the wood. The chips are again washed and cooked in a liquor of low alkalinity to complete fiber liberation. *No 319,447*—Wood chips are digested for 2 to 4 hours at 300° to 350° F. with an alkaline liquor containing 0.5 to 1.0 lb. of active alkali per cu. ft., the alkali being present in the form of caustic soda and (or) sodium sulphide. The spent liquor is removed and the chips are washed. The chips are then digested for 2 to 6 hours at 300° to 350° F. in a suitable sulphite liquor containing 5 to 10 per cent of a soluble sulphite (preferably sodium sulphite) so that fiber liberation is complete in a reasonable time without excessive temperature.—A. P.-C.

Alkaline Pulping Process. National Fibre Corp. Fr. pat. 716,339 (April 30, 1931).—Wood is subjected, in a closed vessel and at a high temperature and without removing the bark, to a preliminary digestion with a weakly basic reagent, such as milk of lime, to remove partially the incrusting substances and open the wood. The material is washed, passed between rolls and subjected to a mechanical pressure in a closed container while being digested with caustic soda solution.—A. P.-C.

Pulping Straw. John Traquair assignor to The Mead Corp U. S pats. 1,843,464 and 1,843,465 (Feb. 2, 1932).—*No. 1,843,464*—A supply of mild alkaline steeping liquor is maintained at a temperature below its boiling-point and at a low pressure, and the straw is passed at a predetermined rate through this alkaline liquor to loosen the bonding constituents. The steeped material is withdrawn from the liquor and the associated black liquor is removed from the material (as by filtration) and recondition to form fresh steeping liquor. *No. 1,843,465*—Straw is treated to separate its fibers and the defibered material is diluted to a low consistency and treated with a halogenating agent such as chlorine (the consistency of the diluted material being controlled to prevent during halogenation any such rise of temperature as would injure the strength of the fiber); the consistency of the material is then raised, followed by further treatment with a halogenating agent.—A. P.-C.

Production of Wood Pulp. Linn Bradley and Edward P. McKeefe. U. S. pat. 1,842,712 (Jan. 26, 1932).—Wood is cooked under pressure and at an elevated temperature with a cooking liquor such as sodium sulphite which is of mild character, and the cooking is completed after the further addition of alkali such as caustic soda to the cooking liquor.—A. P.-C.

Analysis of Sodium Hydroxide (Caustic Soda)*

Tentative Official Standard Method of the Technical Association of the Pulp and Paper Industry

Caustic soda is now marketed in the following forms: solid, flake, ground (powdered), and liquid. Standard commercial caustic soda contains, and is quoted on the basis of, an actual content of 76 per cent of Na_2O, equivalent to 98 per cent of NaOH. It is recommended that purchase and test be made on the basis of actual NaOH (or Na_2O) content instead of "Newcastle" or "New York and Liverpool" tests. The latter tests, now practically obsolete, assume several per cent more alkali than is actually present.

Sampling

Speed is essential in sampling to prevent absorption of moisture and CO_2 from the air. Solid caustic soda shall be sampled by quickly taking small portions of equal amount from not less than 10 per cent of the containers at random. These portions shall be taken at least 2 inches below the surface of the material, transferred immediately to a wide-mouthed bottle, quickly stoppered and sealed with paraffin or with paraffin paper by means of a heated iron. Samples of liquid caustic soda from tank cars shall be taken by means of a "thief" or by lowering a weighted container with an opening about ½ inch in diameter into the car. In this manner the container will fill slowly and a cross section of the car may be easily obtained.

Apparatus

The special apparatus required includes a 50-cc. pipette, a 1-liter volumetric flask and a 100-cc. burette graduated to 0.1 cc. Each shall be accurately calibrated.

Preparation of Solution

Freshly boiled and cooled distilled water shall be used for preparing the solution. If the sample is solid caustic, large lumps shall be broken up in a cotton flannel cloth into pieces weighing between 1 and 2 grams and about 25 grams shall be quickly transferred to a glass-stoppered weighing bottle, stoppered and weighed. The pieces taken shall be clean and dry. For flake and ground caustic, breaking up of the sample is not necessary and it may be transferred directly to the weighing bottle.

About 20 grams of the sample shall be transferred as rapidly as possible to a 1-liter volumetric flask containing about 100 cc. of water, the exact weight being ascertained by again weighing the stoppered weighing bottle with the remainder of its contents. Sufficient water shall be added to about half fill the flask, which shall be stoppered, whirled slightly to dissolve the sample and cooled to room temperature. Finally the solution shall be diluted to the mark with water and mixed thoroughly.

Total Alkali

Transfer 50 cc. of the prepared solution to a 500-cc. Erlenmeyer flask. Add 3 drops of methyl red indicator and then add from the burette sufficient 0.5 N HCl (or H_2SO_4) to neutralize the alkalinity and about 1 cc. in excess. Place a small funnel in the mouth of the flask, boil gently for 5 minutes to expel CO_2, cool, rinse down the sides of the flask with distilled water, add 3 drops of methyl red indicator and titrate the excess of acid with 0.1 N NaOH solution. Subtract from the number of cc. or 0.5 N acid added one-fifth of the back titration with 0.1 N NaOH. The difference is the amount of 0.5 N acid required to neutralize the total alkalinity. Calculate this to Na_2O.

Calculation: 1 cc. 0.5 N acid = 0.01550 gram Na_2O.

Sodium Hydroxide

Pipette 50 cc. of the original solution into a 300-cc. Erlenmeyer flask, add 50 cc. of 10 per cent $BaCl_2$ solution and 5 drops of phenolphthalein indicator. Titrate with 0.5 N acid until the pink color just vanishes. Calculate the burette reading to percentage of NaOH.

Calculation: 1 cc. 0.5 N acid = 0.02000 gram NaOH.

Sodium Carbonate

From the amount of 0.5 N acid required for the total alkali determination subtract the amount required for the NaOH determination. The difference is the amount required for the Na_2CO_3. Calculate the percentage of the latter.

Calculation: 1 cc. 0.5 N acid = 0.02650 gram Na_2CO_3.

Alkalies by Double Titration

For control tests of a routine nature the double titration method may be used as follows:

Pipette 50 cc. of the original solution into a 500-cc. beaker, dilute to about 400-450 cc. with freshly boiled and cooled distilled water, add 1 cc. of phenolphthalein solution and with the tip of the burette beneath the surface of the solution, titrate with 0.5 N acid until the pink color just disappears. Then add 3 or 4 drops of methyl orange indicator and continue the titration to the first appearance of a permanent pink color. The first titration gives the number of cc. of acid required to neutralize all the hydroxide and half of the carbonate, since phenolphthalein is neutral to bicarbonate. The total titration with both indicators gives the total alkalinity. The calculations are as follows:

Let A = cc. required with phenolphthalein
and B = cc. required with methyl orange (total titration).
Then cc. of acid due to carbonate = 2(B — A)
and cc. of acid due to hydroxide = B — 2(B — A) or 2A — B.

Sodium Chloride

Pipette 50 cc. of the original solution into a 200-cc. beaker and add 5 cc. of colorless conc. HNO_3 and about 2 cc. of ferric nitrate indicator. Run in a few drops of 0.1 N sulphocyanate solution from a burette, noting the quantity. Then titrate with 0.1 N $AgNO_3$ solution, adding the latter drop by drop and stirring constantly until the pink color disappears. Add 0.5 cc. more of the $AgNO_3$ solution. Filter off the precipitate and wash well with distilled water. Titrate the combined filtrate and washings to the first formation of a permanent pink color with 0.1 N sulphocyanate. Subtract the total amount of sulphocyanate solution used from the amount of $AgNO_3$ added and calculate the difference to NaCl.

Calculation: 1 cc. of 0.1 N $AgNO_3$ = 0.005845 gram NaCl.

Sodium Sulphate

Pipette 50 cc. of the original solution into a 400-cc. beaker. Dilute with about 150 cc. of water and add one drop of methyl orange indicator. Then add dil. HCl slowly with stirring until the alkali has been neutralized, and finally about 1cc. excess of the acid. Heat to boiling and to the boiling solution add 10 per cent $BaCl_2$ solution drop by drop in slight excess. Boil the solution gently for about 10 minutes and let stand until the precipitate has settled clear (preferably over night). Filter on a quantitative filter paper and test the filtrate for excess of $BaCl_2$ with a drop of H_2SO_4. If an excess is present, wash the precipitate on the filter paper thoroughly with hot water until the washings show no turbidity on adding $AgNO_3$ solution. Place the filter paper containing the precipitate in a weighed crucible, char off the filter paper without burning, finally ignite to a full red heat, cool in a desiccator and weigh as $BaSO_4$. Calculate to Na_2SO_4.

Calculation: $BaSO_4 \times 0.6086 = Na_2SO_4$.

* This method has been approved by the Non-fibrous Materials Testing Committee of the Technical Association of the Pulp and Paper Industry. Suggestions and criticisms should be sent to R. C. Griffin, chairman, 30 Charles River Road, Cambridge, Mass.

Determination of Moisture in Pulp Lap, Wood Chips and Sawdust y Xylene Treatment*

Tentative Official Standard Method of the Technical Association of the Pulp and Paper Industry

The determination of moisture in pulp or wood chips is usually considered as an operation of great simplicity, entailing little or no care, in spite of the fact that large economic considerations often depend upon its accuracy. Nevertheless, the present widely used oven method is considered to have several serious limitations:—

(1) It requires from 6 to 24 hours to get results.
(2) Unless precautions are taken the dried material is weighed in air and absorbs moisture during handling and weighing. Also there is some doubt that cellulose can ever be really dried by this method.
(3) When turpentine or other volatile substances are present they are also included with the water lost by drying at 100 deg. C. This applies most particularly to chips or groundwood pulp.

To overcome these disadvantages the well known distillation method (4)[1] has been proposed. It avoids the above limitations but it has some limitations of its own.

(1) Its accuracy depends on the water being removed from the sample by the time the xylene has been distilled off. This may or may not occur.
(2) It requires more operator's time than either the Oven Method or the proposed Method.
(3) Considerable water as drops may be lost by deposition on the inside of the condenser tube near its lower end.
(4) Atmospheric moisture cannot as conveniently be kept out of the condenser.

The method proposed below has all the advantages of the former distillation method and avoids most of its disadvantages.[2]

I. Apparatus

The apparatus required is as follows: (1) a balance with a capacity of about 1 kilogram and a sensitivity of at least one tenth of a gram; (2) a Liebig condenser with a jacket length of at least 12 inches; (3) a straight drying tube charged with $CaCl_2$; (4) a moisture trap; (5) an accurately graduated and calibrated cylinder of 100 cc or 50 cc capacity; (6) a 2 liter Pyrex short necked balloon flask; (7) a source of heat preferably an electric heater, although a Bunsen burner is adequate; (8) dry xylene; (9) cork stoppers and rubber tubing for connections; (10) iron supporting stand and clamps.

The moisture trap follows the general plan of that used in the Dean-Stark Water determination apparatus[3] but with certain modifications (Fig. 1). It is considerably larger than the 10 cc size ordinarily used and should hold about 100 cc. The exact size is not important. The lower portion only is graduated and is of smaller diameter than the upper part since the boundary meniscus between xylene and water in a glass tube is much more rounding and hard to reproduce in the same shape each time than is the air water meniscus. A glass stopcock is sealed on at the bottom to permit drawing off the water for measurement. The other apparatus is of the ordinary types and needs no particular description. This assembly is shown in Fig. 1.

II. Test Specimen

Pulp samples should be collected in accordance with the present standard methods for pulp sampling. Samples of either wood or pulp should at once be placed in air tight containers (cans or jars) neither heated nor cooled, as far as possible and analyzed as soon as possible.

The samples should not exceed about ½ pound in weight for each determination. If, as in the strip or wedge method of pulp sampling they must greatly exceed this, then separate determinations should be made.

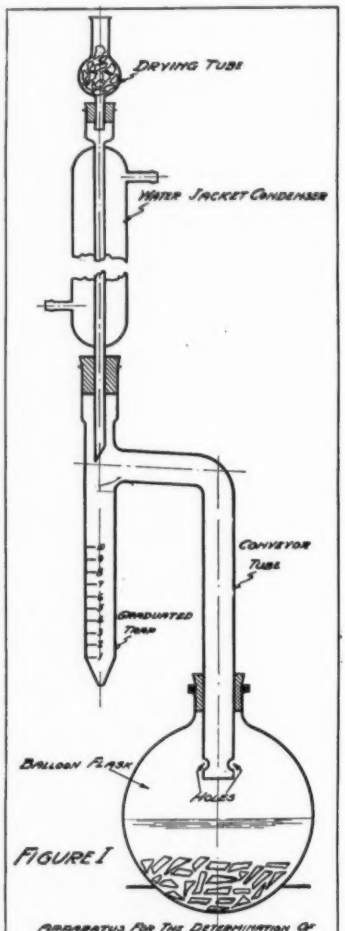


FIG. 1.

* This method has been approved by the TAPPI Pulp Testing Committee. It is based on published contribution—Paper Trade Jour. *93*, No. 16, 6. 31 (Oct. 15, 1931). Send suggestions and criticisms to R. G. Macdonald, 370 Lexington Ave., New York, N. Y.

* Presented at the annual meeting of Technical Association of the Pulp & Paper Industry, New York, N. Y., Feb. 17, 1932.

[1] Method No. 13 Forest Products Laboratory Bulletin "Chemical Analysis of Pulps and Pulp Woods," August 1928 and Schwalbe, Zeit Anggew. Chemie 21:408 (1908).

[2] This method is adapted and modified by Merrill A. Youtz and B. E. Lauer, research director and chemist, Northern Paper Mills, Green Bay, Wis.

[3] Obtainable at any chemical apparatus supply house.

III. Procedure

The jar or can containing the sample is weighed to the nearest tenth of a gram, cover and all. It is then opened and about 100 to 300 grams of the pulp sample transferred to the flask (which already contains 500 cc. of xylene) as rapidly as possible. The cover is replaced on the pulp container which is again weighed. The apparatus is then assembled, the cooling water turned on and the xylene boiled until no more water collects. Either during the boiling or at the end if the trap does not become completely filled with water, the water is drawn off through the stop cock into an accurate graduated cylinder, cooled to below 30 deg. C. and its volume measured.

The xylene should be reasonably pure, preferably colorless, clear and free from visible water droplets. It is unnecessary to dry it, especially if the above conditions are met. It may be used over again if redistilled and dried to the above specifications. Xylene is preferable to kerosene as its boiling point is not so high as to cause serious cracking when drops of water fall back into it during the boiling. Also it is not so high as to risk splitting water out of the cellulose, chemically. Toluene or benzene would perhaps do fairly well but would be less rapid in action. It is unnecessary for the sample in the flask to be covered by the xylene. The amount of xylene (500 cc.) need only be measured approximately.

When draining the water from the apparatus into the measuring cylinder, time for the water to drain from the walls should be allowed and the last portions of water should be drained into the cylinder by touching its lip to the draining tube until all water is removed.

Since a 100 cc. cylinder is graduated only to about 1 cc., a more accurate measurement can be made, for smaller amounts of water by using a 25 cc. or 50 cc. graduated cylinder or a burette. If the amount of water is small due either to a small sample or a very dry sample, it need not be drained off but can be measured on the graduations at the bottom of the trap. The cylinders should be accurately calibrated for use, both for water alone and for water with a xylene layer above it. It sometimes happens that a few drops of xylene remain in the tube at the bottom of the trap and when the water is drawn off this xylene is also removed. Since the water meniscus is of a different shape with air than with xylene the graduate should be calibrated for both conditions. Trap and graduates may be calibrated as follows:—

An accurate burette is used. The trap or graduate is placed level first clean and dry and water from the burette run in up to the first test interval graduation (5 or 10 cc. for the graduates, 1 cc. for the trap) and the burette read. This is then repeated for each interval tested. The operation should be repeated with 5 cc. of xylene in the trap or graduate. The calibration is conveniently represented by graphs showing reading along one axis and actual volume along the other. To minimize the difficulties, due to the meniscus assuming different shapes, the tube should be cleaned frequently, with hot chromic-sulfuric acid cleaning solution. A few drops of water usually collect in the lower part of the condenser tube just above the height reached by the xylene vapors. Where the amount of sample is 100 grams or more or the amount of water 10 cc. or more the amount of these drops is too small to be considered. But to minimize it, the condenser should be cleaned frequently with hot cleaning solution.

The drying tube at the top of the condenser is necessary to prevent condensation of moisture from the atmosphere if the humidity is high.

The volume of water collected measured in cubic centimeters is divided by the weight of sample in grams and the result multiplied by 100 to give the amount of water in per cent.

$$\frac{100\ V}{W} = P$$

IV. Report

The results are reported in per cent of water by weight.

V. Accuracy

The method is accurate to within about 0.2 of a cubic centimeter of water. What this represents in percentage accuracy depends on the size of sample and amount of water. For amounts of water under 10 cc. and with accurate calibration of the trap with water under xylene, this may be increased to an accuracy of 0.1 cc. of water. The method is much superior to oven drying and usually gives slightly higher results since cellulose can be completely dried only with difficulty, if at all, and then must be weighed in a dry atmosphere. The method also does not give, as water, any other volatile impurities such as turpentine unless they are soluble in water. It is hence especially valuable for ground wood pulp, wood chips or sawdust.

VI. Large Samples

Where samples are very large and must be so in order to get accurate sampling, the method is applicable by breaking up the large samples into several smaller ones or by using a 5 liter flask containing 1000 cc. of xylene. If this requires more laboratory attention than is available the drying method must be resorted to.

VII. Time Required

Once the apparatus is assembled, the entire determinations can be carried out in not over 1½ hours. For small samples or small amounts of water and rapid boiling, this can sometimes be shortened to 30 minutes. Since the operator's attention is required during only part of this time, from 5 to 10 or more samples can be tested at once. Operator's time required is but little more than for the oven method and the results are available a great deal sooner.

Analysis of Alum*

Tentative Official Standard Method of the Technical Association of the Pulp and Paper Industry

The alum used in the paper industry is a basic aluminum sulphate containing approximately 14 molecules of water of crystallization. The term basic indicates that there is more Al_2O_3 present that is theoretically necessary to combine with the SO_3 present to form $Al_2(SO_4)_3$. Papermaker's alum is ordinarily available in two grades: Commercial and Iron-Free. The former contains approximately 0.5 per cent of iron, most of which is present in the ferrous condition. The latter contains usually less than 0.01 per cent of iron, all of which is present in the ferric condition. The following determinations are necessary to conduct a complete analysis of a sample of alum: insoluble matter, combined alumina, total iron, ferric iron, and surfur trioxide.[1]

For referee work and in cases of dispute the procedures described under "Complete Gravimetric Analysis" shall be used.

* This method has been approved by the Non-Fibrous Materials Testing Committee of the Technical Association of the Pulp and Paper Industry. Suggestions and criticisms should be sent to R. G. Griffin, chairman, 30 Charles River Road, Cambridge, Mass.

[1] There have been on the market alums containing as high as 2 per cent of zinc in the form of $ZnSO_4$, but they are very uncommon today. The presence of Zn does not interfere with the analysis nor with the use of the alum. It does, however, affect the calculation of the gravimetric analysis and for accurate results should be determined if in appreciable amount. The same is true of other impurities.

For routine control work the procedures described under "Routine Analysis" give sufficiently accurate results if carefully carried out.

Sampling

(A) *Ground Alum:* Samples shall be taken from 5 per cent of the packages and the several portions thoroughly mixed and quartered to a 1 pound sample to represent the shipment.

(B) *Ingot or Lump Alum:* Fragments chipped from 12 ingots taken at random from different parts of the shipment shall be ground and quartered to a 1-pound sample.

COMPLETE GRAVIMETRIC ANALYSIS

Insoluble Matter

Dissolve 20 grams of the sample in about 150 cc. of hot water. Filter through a Gooch crucible which has previously been dried at 100-110 deg. C. and weighed. Wash the residue thoroughly with hot water until the washings are free from sulfates. Dry in the oven to constant weight at 100-110 deg. C. and calculate the percentage of insoluble matter.

Total Soluble Alumina[2]

(a) Solutions Required:

Methyl Red: Dissolve 1 gram in 500 cc. of neutral alcohol.

Washing Solution: Dissolving 20 grams of NH_4Cl (or NH_4NO_3) in 1 liter of water.

(b) Determination: Carefully transfer the filtrate from the insoluble matter to a liter volumetric flask, cool to room temperature, dilute to the mark with water and mix thoroughly. Designate this as solution *A*.

Pipette duplicate 25 cc. portions (equivalent to 0.5 gram) into 400-cc. beakers and add 160 cc. of water and approximately 5 grams of NH_4Cl. Stir until the latter is dissolved, then add 2 cc. of conc. HCl and 4 cc. of conc. HNO_3 and boil gently a few seconds to oxidize the iron.

Before percipitating the alumina, prepare the filter paper in the filtering funnels and have the washing solution ready in a wash bottle. To the hot solution add fresh dil. NH_4OH (1:1) until the alumina is only partly precipitated. Then add a few drops of methyl red indicator and continue the addition of NH_4OH drop by drop until the indicator just turns yellow. Then boil for 1 minute (no longer) and filter immediately on a porous quantitative filter paper. (If boiled too long or if allowed to stand too long before filtering, the preciptate becomes slimy and filters much more slowly. The filtration is also much more rapid if the filter paper is kept nearly full.) Wash the precipitate thoroughly with the hot washing solution until the filtrate is free from SO_3. With the first 2 or 3 washings play the steam around the top of the filter with sufficient force to remove the precipitate to the apex of the funnel.

Place the filter paper and contents, apex up, in a weighted platinum crucible and ignite over an ordinary burner very carefully, starting with a very low flame and gradually working it up to full heat in about an hour. (If preferred the filter paper may be carefully folded over the wet precipitate, placed inverted in the crucible and dried in an over at 95 to 100 deg. C. before heating over the burner.) After all the carbon is burned off, heat over a blast lamp for 5 minutes, cover the crucible and place in a desiccator until cool. Weigh as rapidly as possible and then ignite (uncovered) in the blast lamp for another 5 minutes. After the covered crucible has again been cooled in a desiccator, place all the weights on the balance pan before removing the crucible from the desiccator. In this way the final weighing can be made almost instantly. Continue the 5 minutes ignitions in the blast lamp until the weight is constant. Calculate the weight of $Fe_2O_3 + Al_2O_3$ to percentage of the original sample and subtract the percentage of Fe_2O_3 separately determined as described later.

[2] Reference: Jour. Am. Chem. Soc. 38, 1282-1297 (1916).

Note: If any other sulphates than those of Fe and Al are present, a double precipitation is necessary for accurate results. In this case the precipitate on the filter should be dissolved in warm HCl, the solution diluted to 200 cc. and the precipitation repeated in exactly the same manner after dissolving 5 grams of NH_4Cl in the liquid. It is not necessary in the second precipitation to use any HNO_3.

Total Iron

Dissolve 10 grams of the original sample in about 200 cc. of water in a 500-cc. wide-mouthed Erlenmeyer flask with the aid of heat. Add cautiously 2 or 3 cc. of conc. H_2SO_4 and 0.1 N $KMnO_4$ solution drop by drop until a pink color remains. Reduce the iron with a Jones reductor or by sulfur dioxide, as described below and titrate the solution immediately with 0.1 N $KMnO_4$ solution. From the titration calculate the total iron in terms of Fe_2O_3.

Calculation: 1 cc. 0.1 N $KMnO_4$ = 0.008 gram Fe_2O_3.

(a) Jones Reductor Method: The Jones reductor consists of a glass tube about 30 cm. long and 18 mm. inside diameter with a glass stopcock at the bottom. In filling it, first place a platinum spiral or a few glass beads in the bottom and then a plug of glass wool followed by a thin layer of asbestos such as is used for Gooch crucibles. Finally fill the tube with amalgamated zinc to within about 5 cm. of the top and cover it with a little glass wool serving as a filter.

The amalgamated zinc may be prepared as follows: Dissolve 5 grams of mercury in 25 cc. of dil. HNO_3 (1:1), dilute to 250 cc. and transfer to a heavy liter flask. Add to the solution 50 grams of granulated zinc (20 to 30 mesh), shaking the mixture thoroughly for 1 to 2 minutes and then pour off the solution and wash the zinc free from acid with distilled water.

Prepare the Jones reductor for use by connecting it to a suction flask and connecting the latter with a vacuum pump. Fill the reductor while the stop-cock is closed (or nearly so) with warm 5 per cent H_2SO_4 (by volume) and then open the stopcock so that the acid runs through slowly. Continue to pour acid in until 200 cc. have passed through; then close the cock while a small quantity of liquid is still left in the funnel. Never allow air to suck through the amalgamated zinc. Discard the filtrate and again pass through the reductor 100 cc. of warm 5 per cent acid. Test this with 0.1 N $KMnO_4$ solution. A single drop should color it permanently. If it does not, repeat the washing. (If it is impossible to obtain an acid solution which does not color with 1 drop of $KMnO_4$ solution, the entire filtrate may be titrated and the titration applied as a negative blank correction in the determination).

Pour the acid solution of the alum while still hot, but not boiling, through the reductor at a rate not exceeding 50 cc. per minute. Wash out the container with 5 per cent H_2SO_4 and follow the alum solution without interruption with about 175 cc. of warm acid and finally with 75 cc. of water, leaving the funnel partly filled. Remove the filter flask, cool the solution under the water tap and titrate to a faint pink with 0.1 N $KMnO_4$ solution directly in the flask.

(b) Sulfur Dioxide Method: To the alum solution which has been oxidized with $KMnO_4$ add NH_4OH slowly until the solution just turns red litmus paper blue, then place the flask over a flame and while heating pass in washed SO_2 gas until the solution becomes colorless. Boil quietly for about 10 minutes, then add 50 cc. of dil. H_2SO_4 (1:1) and boil until free from all SO_2. This usually requires about 5 minutes more. Cool and titrate immediately with 0.1 N $KMnO_4$.

Ferric Iron

(a) Standard Iron Solution: Dissolve 0.500 gram of ferrous ammonium sulphate[3] in 50 cc. of water and add 20 cc. of dil.

[3] Pure, fresh crystals of $Fe(NH_4)_2(SO_4)_2 \cdot 6H_2O$.

H_2SO_4 (1:1). Warm slightly and add $KMnO_4$ solution drop by drop until the $FeSO_4$ is completely oxidized as shown by a permanent pink color. Cool and dilute with water to 1 liter. 1 cc. of this solution equals 0.0001 gram of Fe_2O_3.

(b) DETERMINATION: Pipette 50 cc. of solution *A* (equivalent to 1 gram of the sample) into a 100-cc. Nessler tube. Add 5 cc. of conc. H_2SO_4, cool and add 20 cc. of 1 per cent KSCN or NH_4SCN solution. Dilute to the 100-cc. mark with distilled water and shake thoroughly. In another similar Nessler tube place about 50 cc. of water, 5 cc. of conc. H_2SO_4, 20 cc. of the sulphocyanate solution and enough water to fill the tube nearly to the 100-cc. mark. Titrate the blank immediately with the standard iron solution until the red color is equal in intensity to that of the alum solution. The amount of Fe_2O_3 in the standard iron solution used for the titration is equivalent to the Fe_2O_3 in 1 gram of the original alum. In other words, each cc. of the standard iron solution is equivalent to 0.01 per cent of Fe_2O_3.

Ferrous Iron

Subtract the ferric iron as Fe_2O_3 from the total iron as Fe_2O_3. The difference is the ferrous iron in terms of Fe_2O_3. Multiply this by 0.90 to obtain the ferrous iron in terms of FeO.

Sulphur Trioxide[4]

Pipette 50 cc. of solution *A*, equivalent to 1 gram of the sample, into a 400-cc. beaker. Add 300 cc. of water and 2 cc. of 2 per cent HCl solution and heat to boiling. In a separate small beaker heat 25 cc. of 10 per cent $BaCl_2$ solution to boiling. Pour the hot $BaCl_2$ solution rapidly into the boiling solution of the alum. Stir well and set aside at room temperature, protected from fumes, for at least 18 hours (over night). Filter and wash with hot water until 25 cc. of the filtrate show not more than a slight opalescence with $AgNO_3$ solution. Place the filter and precipitate in a weighed platinum crucible and heat very slowly and carefully over a very low flame to char the filter paper without allowing it to catch fire. After complete charring ignite to constant weight over an ordinary burner, with the crucible uncovered, cooling between weighings in a desiccator. Calculate to percentage of SO_3.

Calculation: $BaSO_4 \times 0.3430 = SO_3$.

Note: If the charring of the paper is too rapid, some of the $BaSO_4$ may be reduced to BaS. In such a case moisten the precipitate with conc. H_2SO_4, heat very carefully to drive off the acid and finally ignite.

Final Calculations: Calculate the ferrous and ferric iron respectively to $FeSO_4$ and $Fe_2(SO_4)_3$. Subtract the amount of SO_3 in the iron sulphates from the total SO_3 and calculate the remaining SO_3 to $Al_2(SO_4)_3$. If the total soluble Al_2O_3 is in excess of the amount required for the $Al_2(SO_4)_3$, report the difference as basic alumina. If the amount of SO_3 is in excess of that required for the iron and the alumina, calculate the excess to H_2SO_4 and report as free sulfuric acid.

Factors:
$Fe_2O_3 \times 2.563 = Fe_2(SO_4)_3$.
$FeO \times 2.114 = FeSO_4$.
$SO_3 \times 1.4244 = Al_2(SO_4)_3$.
$Al_2O_3 \times 3.3562 = Al_2(SO_4)_3$.
$SO_3 \times 1.2250 = H_2SO_4$.

ROUTINE ANALYSIS

Insoluble Matter

Follow the procedure previously described.

[4] Reference: Jour. Am. Chem. Soc. 32, 588-617 (1910).

[5] The amount of phenolphthalein solution must be measured carefully. A pointed tube may be used if the operator has previously determined how many drops from it are equivalent to 5 drops from the full opening of a 4-mm. tube. An error of as much as 0.2 or 0.3 per cent may easily be made if this precaution is not observed.

Basic Alumina

(a) SOLUTION REQUIRED:

(1) *Phenolphthalein:* Dissolve 5 grams of phenolphthalein powder in 250 cc. of alcohol and add 250 cc. of distilled water.

(2) POTASSIUM FLUORIDE: Dissolve 960 grams of anhydrous KF or 1600 grams of crystallized $KF.2H_2O$ in about 8 liters of recently boiled and distilled water and add 16 cc. of the phenolphthalein solution; then add slowly a 50 per cent solution of NaOH (free from carbonates) until a pink color is obtained; and finally add 5 cc. in excess, mix thoroughly and let stand for 3 days. Filter and dilute the solution, depending upon the temperature, as follows:

Temperature	Baumè Gravity	Specific Gravity
60 deg. F.	7.1	1.052
70	6.9	1.050
80	6.7	1.048

Neutralize with pure HF to a faint pink. The neutrality should be tested so that when 30 cc. of the KF solution are mixed with 50 cc. of distilled water (free from CO_2) there will be a strong pink color present on the addition of 3 drops of the phenolphthalein solution and 1 drop of 0.294 N NaOH. A soda-lime tube should be kept in the stopper of the bottle containing the fluoride solution to keep out CO_2.

(3) *0.294 Normal NaOH (Carbonate-free)*: This should contain 11.76 g. of NaOH per liter. Dissolve 250 grams of NaOH in 500 cc. of water. Let stand until the solution is cool and the carbonate has settled out, leaving a clear liquid. Siphon off the clear solution, dilute to 15 liters with freshly boiled and cooled distilled water and determine the normality by standardizing against benzoic acid and O.1 N HCl, using phenolphthalein indicator. Then add the proper amount of CO_2-free distilled water necessary to bring the solution to 0.294 normal. This normality should again be checked against the benzoic acid.

(4) *0.294 Normal H_2SO_4:* Add 280 grams of conc. H_2SO_4 to about 5 liters of distilled water, cool and dilute to 18 liters. Standardize against the NaOH solution, using methyl orange indicator, and dilute until the normality is exactly 0.294.

(b) DETERMINATION: Dissolve 10 grams of the alum in hot distilled water and dilute to the mark at 20 deg. C. in a 500-cc. volumetric flask. If the insoluble matter is over 0.2 per cent, the solution should be filtered before making up to volume. Pipette 25 cc. of the solution into an Erlenmeyer flask and add 25 cc. of recently boiled and cooled distilled water. Run in exactly 2 cc. of the 0.294 N H_2SO_4 from a burette and add 3 drops of the phenolphthalein solution. Finally add 30 cc. of the KF solution, whirl for 3 or 4 seconds to mix thoroughly and titrate immediately with 0.294 N NaOH to a pink color which is permanent for 1 minute.

Run a blank titration on a mixture of 50 cc. of boiled and cooled distilled water, 2 cc. of the 0.294 N H_2SO_4, 3 drops of the phenolphthalein solution and 30 cc. of the KF solution. The difference between the titration of the blank and the titration of the sample is the amount of NaOH consumed by the latter.

If the amount of NaOH consumed is less than 2 cc. the alum is basic and the number of cc. of 0.294 N NaOH subtracted from 2.00 gives the percentage of basic Al_2O_3. If the amount of NaOH required is more than 2 cc. the alum is acid and the amount of 0.294 N NaOH in excess of 2.00 cc. multiplied by 2.88 gives the percentage of H_2SO_4 in the alum.

Note: This method is an adaptation of Scott's method described in Jour. Ind. Eng. Chem., 7, 1059.

Combined Alumina

(a) SOLUTIONS REQUIRED:

(1) *0.294 Normal NaOH:* Prepare as previously described.

(2) *Barium Chloride:* Saturated solution. (This is used to convert the soluble sulphate to chloride, as basic chlorides are more soluble than basic sulphates and consequently the titration need not be made while the liquid is actually boiling.)

(3) *Phenolphthalein Solution:* Dissolve 1 gram of phenolphthalein powder in 500 cc. of alcohol and add 500 cc. of distilled water. The solution should not be used after any phenolphthalein has begun to precipitate in the bottom of the bottle.

(b) DETERMINATION: Pipette 50 cc. of the solution prepared for the basic alumina determination into an Erlenmeyer flask and add about 50 cc. of distilled water. Drop in exactly 5 drops of the phenolphthalein solution from a tube with an internal diameter of 4 mm. without a drawn-out tip.[5] Heat to boiling and while boiling add slowly, drop by drop, 5 cc. of the $BaCl_2$ solution. Then run in 0.294 N NaOH until a slight pink can be seen in the supernatant liquid after the precipitate has been allowed to settle to about half the depth of the solution. Heat to boiling again and look for the pink color after settling as before. The pink will have disappeared unless too much NaOH was added. Now add more NaOH, a drop at a time, allowing to settle and observing the color after each drop. When the first faint pink is obtained the end-point has been reached. From the amount of 0.294 N NaOH required calculate the percentage of combined Al_2O_3 as follows:

If the alum is basic,

$$\text{Percentage combined } Al_2O_3 = \frac{\text{cc. NaOH}}{2} - (0.47\ FeO + 0.64\ Fe_2O_3)$$

If the alum is acid,

$$\text{Percentage combined } Al_2O_3 = \frac{\text{cc. NaOH}}{2} - (0.47\ FeO + 0.64\ Fe_2O_3 + 0.347\ H_2SO_4)$$

Note: Most operators can detect the pink end-point best by holding a sheet of white paper about 4 or 5 inches back of the flask so that the reflected light from a window is seen horizontally through the supernatant liquid.

Reference: Jour. Ind. Eng. Chem. 13, 420.

Total Alumina

The total Al_2O_3 is the sum of the combined and basic Al_2O_3. If the percentage of $Al_2(SO_4)_3$ is desired, multiply the combined Al_2O_3 by 3.356.

Total Iron and Ferric Iron

These are determined as previously described.

[5] The amount of phenolphthalein solution must be measured carefully. A pointed tube may be used if the operator has previously determined how many drops from it are equivalent to 5 drops from the full opening of a 4-mm. tube. An error of as much as 0.2 or 0.3 per cent may easily be made if this precaution is not observed.

Analysis of Mineral Fillers*

Tentative Official Standard Method of the Technical Association of the Pulp and Paper Industry

Various white minerals are used as paper fillers, among the common ones being china clay (kaolin), calcium sulfate in its various forms, talc, asbestine, blanc fixe and precipitated chalk. In most cases the physical properties are of more importance than the chemical composition in judging the suitability of a paper filler. Certain general tests are equally applicable to fillers of different types. There are also specific tests which are confined only to a given type. In this method the general tests are given first and then the specific tests applying to the different classes of fillers.

(1) GENERAL TESTS

Sampling

If the material is in bags or barrels, 10 per cent of the packages shall be sampled, preferably with a trier, taking an equal amount from each package sampled. This gross sample shall be very thoroughly mixed and if necessary quartered down to a suitable size before testing. If the material is in bulk, it shall be sampled preferably at regular intervals during unloading, or, if this is not possible, in such a way as to obtain a representative sample of the entire shipment. In any case the gross sample of a bulk shipment shall be not less than 100 pounds. The gross sample shall be quartered down (see method for sampling Coal) to a suitable laboratory size and transferred to a stoppered container.

Color

The color of a sample of filler is usually compared to the color of a standard sample mutually agreed upon. In making color comparisons both the sample and the standard shall be under similar conditions as to content of free moisture. This is accomplished by drying thoroughly in an oven at 100-105 deg. C. for at least 4 hours (preferably overnight). The following procedure is recommended for color comparison:

After drying the sample grind it to break up any lumps and spread a small amount on a piece of smooth paper. Beside it spread a similar amount of the dried standard sample. Move one pile toward the other until they are in contact and press them down with a polished stainless-steel spatula to give a smooth surface. If the two samples are of the same color, it will be impossible to see any line of demarcation between them.

Grit (Sieve Test)

Place 10-20 grams of the sample (or more if the amount of grit is very small) on a No. 200 sieve[1] and wash with a slow stream of water until the water leaving the screen is clear. Hard lumps of the filler may be broken up with a soft, flexible rubber policeman of the flat type but no harder material shall be used for this purpose and great care must be taken that particles of grit are not broken up and passed through the screen. A camel's-hair brush may also be used for this purpose. Dry the material remaining on the screen at 100-105 deg. C., transfer to a suitable small container and weigh. Calculate the percentage retained on the screen.

The dried grit should be placed on a slide and examined under a microscope, noting particularly the presence, color and proportion of mica, quartz and also any other unusual substances.

(2) CLAY

Clay is a soft friable product resulting from the weathering of feldspathic minerals. It is essentially a mixture of hydrated silicates of aluminum, containing particles of quartz, mica and feldspar and its chemical composition is approximately $Al_2O_3 \cdot (SiO_2)_2 \cdot 2H_2O$. Even the very finest washed clays contain a small proportion of sand and mica and there is always some moisture present. The free moisture is driven off on drying at 100 deg. C. but the combined water of constitution is given off at temperatures about 500 deg. C.

General Tests and Sampling

See previous section (1).

Disintegration Test

Place a few lumps of the clay in water and let stand without agitation. A good clay will soon begin to disintegrate and in a short time the lumps will disappear entirely and will produce a smooth cream. In case the clay does not disintegrate well

* This method has been approved by the Non-Fibrous Materials Testing Committee of the Technical Association of the Pulp and Paper Industry. Suggestions and criticisms should be sent to R. C. Griffin, chairman, 30 Charles River Road, Cambridge, Mass.

[1] If a small sieve (3 inches in diameter) is used, the sieve may be dried and weighed on the analytical balance before making the test, thus avoiding transferring the residue to another container.

there will be found small pellet-like particles which can only be broken down by rubbing between the fingers. Such clays will be likely to cause difficulty in preparing for use.

Flotation and Settling Tests

These tests are empirical and shall not be used to settle a controversy until the details of making the tests have been previously agreed upon.

(a) FLOTATION TEST: Measure a depth of 2 inches from the bottom of a 500-cc. beaker and make a mark on the beaker to indicate this height. Weigh 20 grams of the clay into the beaker, mix thoroughly with water and fill up to the mark. Let settle for exactly 1 minute and pour off the milky water. Repeat the process until the supernatant water can be poured off practically clear at the end of a minute. Place the beaker on the steam bath until perfectly dry, brush out the settled grit into a balanced watch glass with a camel's-hair brush and weigh it.

The flotation test may also be carried out[2] by means of a large wide-mouthed bottle fitted with an inlet tube for water and a siphon tube whose inlet is always kept near the surface of the liquid by means of a float. This siphon is fitted with an automatic stop to prevent entirely emptying the bottle. The clay, or other filler to be tested, is mixed with water and placed in the bottle and water is forced in rapidly through the inlet tube until it rises to a mark near the neck. The mixture is allowed to stand a definite time and the siphon then started; this process is repeated until at the end of the settling period the water is perfectly clear or a definite distance down from the filling mark. Any material settling more than this distance in the standard time is considered as grit and its quantity is determined by drying and weighing. It is evident that the dimensions of this apparatus may be arranged to suit the convenience of the operator, but those of an outfit which gives very satisfactory results with clay, blanc fixe, asbestine, etc., are shown in Fig. 1. This method cannot be employed with calcium sulphate because of its solubility.

(b) SETTLING TEST: Place 10 grams of the sample, free from lumps, in a 100-cc. graduated cylinder, preferably glass-stoppered and add distilled water slowly until the upper level reaches the 100-cc. mark, making sure that no air is entrapped with the filler. Stopper the cylinder, shake thoroughly and place the mixture in an upright position, at the same time starting a stop-watch. At regular intervals note the reading of the stop-watch and the volume of clear water which has separated away from the filler. If desired this may be plotted in the form of a curve to compare the settling rate with other samples.

[2] Sutermeister: "Chemistry of Pulp and Papermaking," page 368 (1929).

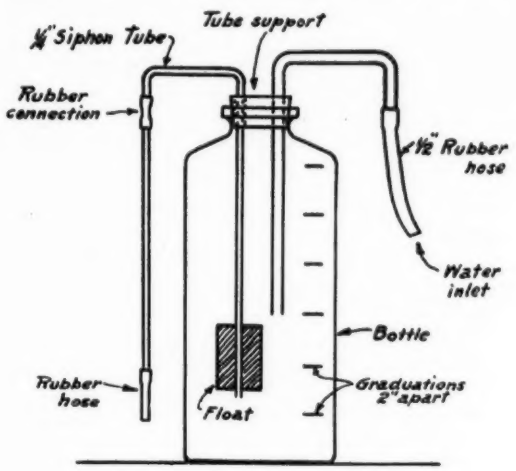


FIG. 1
Apparatus for Flotation Test

Artificial Coloring

No tests for artificial coloring have been proposed which are entirely satisfactory. The following are recommended as usually reliable:

(1) In one of two similar white porcelain dishes place a measured amount of freshly prepared lime water, and in the second place an equal amount of distilled water. Dust in equal amounts of the clay in question slowly from the end of a spatula. Let stand a few minutes and siphon off. If blued, the clay in the lime water will show an entirely different color than the clay in plain water.

Note: This test cannot be used if the clay has been blued with a pigment or other blue fast to alkalies, as in these cases the blue is not destroyed by the limewater.

(2) Mix about 25 grams of the clay to a heavy paste with water in a small beaker and stir in thoroughly 3 cc. of conc. NH_4OH. Then place the beaker on a steam bath until the NH_3 has been completely volatilized and note the condition of the surface of the clay. When it first becomes dry there is a brownish coloration which changes to blue in the presence of artificial blue when all NH_3 has been expelled. This method is quite sensitive but shows the presence of soluble blues only, since pigments such as indanthrene or ultramarine are not brought to the surface.

Adulterants

Treat about 10 grams of the clay with warm dil. HCl on the steam bath for about 15 minutes. Filter and test the filtrate for Ca and for SO_3. Also note whether the clay effervesces on treatment with the HCl. The presence of an appreciable amount of Ca in the acid solution, accompanied by SO_3 or effervescence, indicates either $CaSO_4$ or $CaCO_3$. If it is suspected that the sample is not true china clay, it should be fused with Na_2CO_3 and a chemical analysis made.

Note: According to Sutermeister talc may be distinguished from clay by moistening with a little $Ca(No_3)_2$ solution and warming over a flame. Talc gives a pinkish color and clay a strong blue.

(3) CALCIUM SULPHATE FILLERS

Various forms of calcium sulphate are used as paper fillers. Gypsum is a natural mineral having the chemical formula $CaSO_4.2H_2O$. It may be ground and used directly as a filler or may be calcined to remove the water of crystallization and then ground. The ground uncalcined mineral has the form of plates. Pearl Hardening is an artificial, hydrated calcium sulphate made by precipitating a solution of $CaCl_2$ with Na_2SO_4. It may occur in two forms, either flat, tabular crystals or small, needle-shaped crystals. Other names for prepared calcium sulphate fillers, either hydrated or anhydrous, are pearl white, crown filler, pearl finish, alabastine, etc. Calcium sulphate from natural sources is usually slightly alkaline; that made artificially may contain acid.

For methods of sampling and determination of color, see previously under general tests for paper fillers.

Grit (Sieve Test)

Place 200 grams of the sample on an 80-mesh sieve and complete the test as described previously under general methods for paper fillers. A minimum amount of water should be used in making the test on account of the solubility of this class of fillers.

Total Water

Ignite a 1-gram sample in a weighed platinum crucible over a Meker burner to constant weight. The percentage loss in weight shall be reported as the total water.

Free Moisture

Assuming all the residue from the ignition loss to be $CaSO_4$, multiply this by the factor 1.265 to convert it to $CaSO_4.2H_2O$. If the figure thus obtained on a percentage basis is less than 100, the difference between the percentage of $CaSO_4.2H_2O$ and 100 per cent shall be reported as free of mechanical moisture. If the calculated $CaSO_4.2H_2O$ is greater than 100 per cent, the material is a calcined product. In such a case the approximate amount of free moisture may be determined by drying a 1-gram sample to constant weight at 105 deg. C.

Combined Water

The difference between the total water and the free moisture shall be reported as combined water.

Free Acid

Weigh out accurately 10-15 grams of the powdered sample into a 250-cc. casserole or beaker. Add 100 cc. of water and a few drops of methyl orange indicator and stir well. If the solution is pink, titrate with 0.01 N NaOH until the pink color just changes to yellow. Calculate the titration to percentage of HCl.

Calculations: 1 cc. 0.01 N NaOH = 0.00036 gram HCl.

Note: The 0.01 N NaOH may be conveniently prepared by diluting 100 cc. of 0.1 N NaOH to 1 liter in a volumetric flask with freshly boiled and cooled distilled water.

Iron Oxide

Weigh 1 gram of the powdered sample into a 100-cc. casserole or beaker and add about 15 cc. of conc. HCl, free from iron. Warm the mixture on the steam bath and add slowly sufficient water to bring the sample into solution. Usually about 25 cc. are required. Transfer to a 100-cc. Nessler tube and add 0.1 N $KMnO_4$ solution drop by drop until a permanent pink color is produced. Then add 10 cc. of 2 per cent KSCN solution and dilute to the 100-cc. mark on the tube. Mix thoroughly and compare the color at once with a standard iron solution of which 1 cc. is equivalent to 0.0001 gram of Fe_2O_3. The comparison shall be made in another Nessler tube similar to that containing the sample, to which has been added the same amounts of conc. HCl and 2 per cent KSCN solution as were used for the sample, and the mixture diluted to the 100-cc. mark with water. Then the standard iron solution shall be added carefully from a burette drop by drop, stirring after each addition until the color matches the color of the solution of the sample. From the number of cc. of standard solution required calculate the percentage of Fe_2O_3 in the sample.

Standard Iron Solution

Dissolve 0.500 grams of ferrous ammonium sulphate, $Fe(NH_4)_2(SO_4)_2 H_2O$, in 50 cc. of distilled water and add 20 cc. of dil. H_2SO_4 (1:1). Warm slightly and add $KMnO_4$ solution drop by drop until the $FeSO_4$ is completely oxidized as shown by a permanent pink color. Cool and dilute with water to 1 liter. 1 cc. of this solution = 0.0001 gram Fe_2O_3.

Foam Control Subcommittee Report*

Foam is a serious problem in the manufacture of paper and no grade is excepted. For this reason, the committee on waste decided it was of interest and at the fall meeting in Kalamazoo, in September, formulated plans to further its knowledge concerning this vital problem.

Three members of the general committee were assigned to study the problem with the suggestion that the literature be reviewed and from this review specific points would probably be located where further study would be of value.

Your subcommittee wishes to offer a brief preliminary report of the problem as they view it at present.

Some, but not all, of the literature has been reviewed and it is the desire of your chairman to assign to committee members, groups of published articles for review. From the abstracts it is hoped that we will be able to pick out two or three problems which show some signs of producing further information along the line of foam causes.

The problem of foam prevention is furthest from your chairman's mind at the present writing, it being his firm belief that the cause is of far more vital interest and importance.

Causes for Foam

L. M. Booth of the Booth Chemical Co., and a member of the subcommittee has given us five causes for foam. In some instances the type of foam and its cause is very similar, however, by classifying them we are left free to find other causes than those mentioned and apply them to the same class.

1. Mechanical. This may be caused by leaky pumps, improper agitation, churning in pumps, etc.
2. Chemical. Results whenever sizing is increased. Results from reaction of alkaline shower water on acid stock.
3. Bacterial. Fermentation and decomposition in some grades of stock when left standing.

It has been particularly notoed by the writer that an increase of sizing on our machines always brings an increase of foam and this I believe is generally true. Foam killers are on the market and in many cases are quite effective in reducing the foam after formation. We are not interested as a committee in them. We want to locate the cause and then we perhaps can apply preventatives rather than cures.

Temperature Effect

It has been reported that there seems to be a critical temperature, for beating and other stock preparatory operations, above which trouble will be experienced with foam. It is probable that this temperature will vary with local conditions but it nevertheless is a definite factor to be considered.

The matter of mechanical foam is more or less a strictly local condition and, while rather important in some instances, your chairman feels that it is less worthy of consideration by the committee than the other two classes.

Committee Plans

It is suggested by your chairman that we proceed in one of two ways:

1. All three members of the subcommittee concentrate on one class of foam, after reviewing the literature, and endeavor to gather further data.
2. Review literature as noted above but then divide the committee and work on both classes of foam at the same time.

The policy of the committee should be decided at this meeting and suggestions of any interested persons present will be greatly appreciated and will be a guiding factor in helping the committee to determine its policy.

Anyone interested and willing to work on the committee will render us a good turn if you will make your interest known.

E. F. Whittington, Chairman.

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 15-18, 1932.

Wood Chemistry Research at Idaho University

By Edwin C. Jahn [1]

The Idaho School of Forestry, located at the University of Idaho, Moscow, Idaho, has expanded its research program by establishing a wood chemistry research laboratory. This work was inaugurated a little over one year ago, at which time a general research laboratory was equipped in Morrill Hall, the home of the School of Forestry.

However, it soon became apparent that additional space was required for semi-commercial and technical investigations. This expansion was particularly desirable because research on the chemical and mechanical utilization of wood was the purpose for which the laboratory was established. The physical plant for this phase of the work is now complete. During the past summer a new frame building was built and installation of equipment has just been completed. The new building is termed the Wood Conversion Laboratory. It is of plain, simple design with concrete floor and excellent natural and artificial lighting. The construction is extraordinarily strong in order to withstand vibration.

Since the laboratory is not confined to any one type of utilization research (i. e., for example, pulp, chemicals, or lumber) the equipment has been designed to be as flexible as possible in order that it might be adapted to the needs of various problems. The laboratory is fitted for high vacuum and high and low pressure work. One stationary autoclave or digester is fitted for both direct and indirect steam pressure, 29.8 inches vacuum, and up to 250 pounds nitrogen gas pressure. This vessel will be used primarily for impregnation studies, but may also be used for steaming or digesting. A chrome nickel steel autoclave of 800 cc. capacity will be used for acid, neutral,

View in Wood Chemistry Laboratory

and alkaline pulping studies under constant temperature control. This small autoclave is also fitted for vacuum and high nitrogen pressure work. A rotating alkaline or neutral digester of one cubic foot capacity completes the pressure equipment.

Processing equipment for pulp, liber boards, etc., include a 12 inch by 24 inch stainless steel rod mill, a diaphragm screen, a specially designed board or sheet machine, and a large hand press.

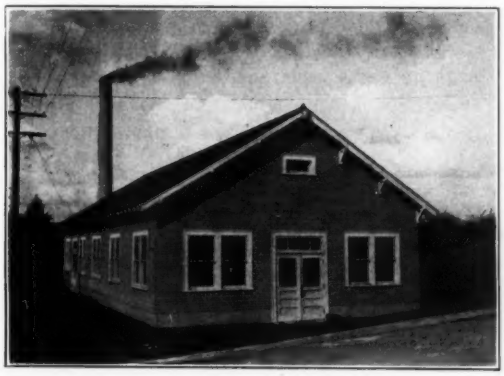
Testing equipment includes a freeness pulp tester, a rate of flow pulp tester, a penescope moisture penetration tester, a static bending machine, a hardness tester for wood and molded products, and a fire-resistance testing machine.

A specially designed penetration instrument will be used for studies on liquid penetration into wood.

For molding and pressure studies a 30 ton hydraulic press with 12 inch electrically heated platens has been installed. Appropriate molds and press boxes have been made for this work.

A constant temperature-humidity chamber completes the special equipment. Much of this apparatus was made locally in the university shops.

The original laboratory in Morrill Hall, is equipped as a general organic or wood chemistry laboratory. The new wood conversion laboratory also contains a large chemistry bench.



Wood Conversion Laboratory

As already stated, the primary function of the newly instituted wood chemistry work is research on the chemical and mechanical utilization of wood. This does not mean that fundamental research will be omitted. On the contrary, many of the utilitarian investigations must be preceded by and accompanied by purely fundamental or theoretical studies. Another function of the laboratory which should not be underestimated is the training of graduate students for conducting future wood chemistry research and for the wood using industries.

The wisdom of the Idaho School of Forestry in establishing research in wood chemistry becomes apparent when it is realized that forest wealth is one of the greatest assets of Idaho, and that lumbering is one of the state's greatest industries.

But the state is realizing only a fraction of its potential wealth in timber. Lumber is the principal product of the forest. As is well known, there is a great loss of wood substance between the forest and sawn lumber, and a further loss in the conversion of the lumber to the finished product. Moreover, a large percentage of the standing timber consists of species not economically attractive at a time like the present when the industry is in a particularly sluggish condition, mills are overstocked and running on part time or closing down temporarily.

It is essential to increase the forest values of the state. Among means to this end are expansion of the number of useful products obtained from wood, and the profitable use of species of secondary importance as well as wood waste. It is with these facts in mind that the Idaho Forestry School organized a wood chemistry research program.

Besides any direct value in the way of productive results that may accrue from this new but modest research program, it is hoped that the laboratory may be of some stimulating value to the state's forest industries. Diversification of the lumber industry—a change from a one product status—would bring

[1] Member TAPPI, associate professor of forestry, University of Idaho.

greater stability to the industry. The School of Forestry can perhaps stimulate thought in this phase of research by the lumber industry and the state. Such thought, and to a greater extent the establishment of private industrial laboratories, will broaden the horizon of the lumber and wood industries.

Research on the chemical utilization of wood, which is gradually increasing the number of useful products from the forest, will have a direct and important effect on the lumbering and logging industries. Diversification of the lumber industry or coordination between it and the wood conversion industries is already beginning. Furthermore, increased forest values will mean a greater tendency toward a continuous timber crop basis.

The problems which the laboratory is studying are not confined to the utilization of wood waste alone but are directed toward the increased utilization of wood in general. The research is being conducted by the writer and graduate students.

In general the projects are as follows:

(1) Pulping studies for cheaper conversion of wood waste and poorer lumber species into pulp
(2) Mechanical conversion of wood and wood wastes into pulps, molded articles, and "artificial lumber"
(3) The fire and moisture proofing of wood and fiber boards
(4) Studies on penetration and water absorption
(5) Fundamental studies on the structure of lignin and applied research on lignin condensation products
(6) Galactan derivatives and their possible commercial use
(7) An investigation of the oleoresins, resins, and essential oils of several Idaho conifers.

Two graduate students did their research in the new laboratory last year. They are Allen Bickford, now with the Forest Service Southern Experiment Station at New Orleans, and Mark Plunguian, who is now wood chemist and technologist with the Potlatch Forests, Inc., a unit of the Weyerhaeuser Lumber Company. Potlatch Forests, Inc., has just recently organized a wood chemistry research laboratory at Potlatch, Idaho. This work is under the direction of Mr. W. D. Humiston. Mr. Plunguian has taken a responsible position in this company's new research program.

While at the University of Idaho, Mr. Bickford completed a preliminary study on the nature of the oleoresin of Alpine fir, and Mr. Plunguian did a comprehensive piece of work on the fireproofing fiber boards.

The wood chemistry research laboratory is an expansion of the Idaho Forestry School's Forest Products Laboratory, in charge of Dr. E. E. Hubert. The Forest Products Laboratory has been conducting research in forest products and pathology for a number of years.

Indirect Heating And Forced Circulation In Sulphite Pulping*

By C. J. Christiansen[1]

Indirect heating with forced circulation in general consists of drawing off the cooking liquor from the digester, passing it through a closed heater and reintroducing it into the digester. No direct steam comes in contact with the chips. There is no localized over-heating. Circulation is positive and rapid and all portions of the digester contents are heated uniformly.

Rhinelander Paper Company Installation

Referring to sulphite, we are at present installing an indirect heating system at the Rhinelander Paper Co. All parts of the system in contact with the acid are of chrome nickel steels properly heat-treated to withstand the sulphite acids.

The system is simple in design and arrangement. It is reasonable in cost as full advantage has been taken of the properties of the new metals and of the present stage of the art of making and fabricating these metals. Developments in their manufacture have been tremendous during the past year. It is only recently that seamless tubes as small as one inch could be obtained, polished internally. The developments in their fabrication have kept pace.

In this system the acid will be drawn off at the top, passed through the heater and reintroduced into the digester at the bottom. This direction of circulation was adopted after careful consideration of digester operation. The circulation in the digester being upward follows natural laws. The warmest acid which normally is at the top, will constantly be drawn off and returned to the colder portion, which is at the bottom. Thermometers have shown the top portion to be as much as 30 deg. C. warmer than the bottom in direct cooking.

All parts of the digester will be heated uniformly. The digester will "blow" easily as there will be no packing of pulp. The strainer being at the top will be relieved of stress due to "blowing." Furthermore, local overheating of the cooking liquor results in an increased escape of free SO_2, which will accelerate the above mentioned reactions.

R. N. Miller in the 1926 Technical Association Papers says in effect that the acid part of the cooking chemical penetrates faster than the bisulphite. If the critical temperature, that is, the temperature at which pulping action proceeds at any appreciable rate is reached before penetration by the bisulphite, the lignin will be so altered that it will not cook. This results in a higher percentage of screenings and consequently lower yield.

From the foregoing it is obvious that local overheating and poor circulation are very detrimental to quality and yield. With indirect heating and forced circulation there can be no local overheating as the circulation is rapid and positive and no high temperature steam comes in contact with the digester contents. The temperature of the digester will be under absolute control. Furthermore, the pressure and corresponding temperature of the steam to the heater can be considerably reduced under that used in the direct cook.

With indirect cooking, so far as the heater is concerned, we are interested in temperatures only. As the temperature in the digester will be between 130 and 150 deg. C. depending on the type of pulp made, steam at a pressure of 35 to 50 pounds only need be used. This low pressure steam will have a marked effect on the heat balance of the mill. The condensate will be returned directly to the boilers. A device is being installed at Rhinelander to detect any contamination of this condensate.

The operation of the digester will be simplified. Side or wet relief will be practically eliminated with the consequent reduction in reclaiming equipment. The cooking operation can be made entirely automatic. Time-temperature control equipment is now available which when applied to the heater will give a predetermined time-temperature curve. This curve can be easily changed to accommodate varying conditions. This together with the automatic pressure-relief controller will give close regulation of the cooking cycle independent of the human element.

* Presented at the November meeting of the Lakes States section of the Technical Association of the Pulp and Paper Industry, Menasha, Wis.

[1] Member TAPPI, chief engineer, Fibre Making Processes, Inc., Chicago, Ill.

WOOD PULP
AGENTS

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SCHOPPER

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WEEK ENDING JULY 2, 1932

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Standard Products Corp., Champlain, Havre, 14 cs.; American Tobacco Co., Paris, Havre, 180 cs.; Champagne Paper Corp., Paris, Havre, 25 cs.; Champagne Paper Corp., Vincent, Havre, 219 cs.; Champagne Paper Corp., France, Havre, 15 cs.; De Manduit Paper Corp., France, Havre, 101 cs.; Max Spiegel & Sons, Augvald, Barcelona, 1 cs.; American Machine & Foundry Co., Augvald, Barcelona, 2 cs.

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R. F. Downing & Co., Olympic, Southampton, 2 cs.; Irving Trust Co., New York, Hamburg, 9 cs.; Globe Shipping Co., Pres. Harding, Hamburg, 1 cs.

PAPERHANGINGS

Whiting & Patterson Co., Inc., Olympic, Southampton, 1 cs.

NEWS PRINT

Perkins Goodwin & Co., Gen. von Steuben, Bremen, 558 rolls.; Jay Madden Corp., Gen. von Steuben, Bremen, 297 rolls; Parsons & Whittemore, Inc., Fred VIII, Oslo, 150 rolls; Perkins Goodwin & Co., New York, Hamburg, 63 rolls; Baldwin Paper Co., New York, Hamburg, 109 rolls.

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P. C. Zuhlke, Westernland, Antwerp, 4 cs.; Gevaert Co. of America, Westernland, Antwerp, 44 cs.; Globe Shipping Co., New York, Hamburg, 1 cs.; International Fdy. Co., New York, Hamburg, 4 bls

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Freedman & Slater, New York, Hamburg, 5 cs.

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Woolen manufacturers since 1856

Gothenburg, 8 rolls; E. H. Sargent & Co., Gripsholm, Gothenburg, 13 cs.; Standard Products Corp., France, Havre, 25 cs.; ——, New York, Hamburg, 88 rolls, 22 bls.

RAGS, BAGGINGS, ETC.

J. Cohen Son & Co., Rotterdam, Rotterdam, 12 bls. rags; J. Cohen Sons & Co., American Trader, London, 34 bls. rags; ——, American Trader, London, 17 bls. felt waste; E. J. Keller Co. Inc., American Trader, ——, 30 bls. rags; E. J. Keller Co. Inc., Vincent, ——, 62 bls. rags; E. J. Keller Co. Inc., Vincent, ——, 58 bls. baggings; G. Schuster, Oriente, Havana, 12 bls. rags; ——, Pres. Harding, Hamburg, 44 bls, rags; American Express Co., California, Glasgow, 15 bls. paper stock, National City Bank, California, Glasgow, 57 bls. paper stock.

HIDE GLUE

——, New York, Hamburg, 100 bags.

OLD ROPE

Chemical Bank & Trust Co., Britannic, Liverpool, 70 coils; National City Bank, E. Francqui, Antwerp, 58 coils; E. J. Keller Co. Inc., American Trader, ——, 62 coils; E. J. Keller Co. Inc., Excambion, ——, 178 coils; ——, Pres. Harding, Hamburg, 47 coils.

CASEIN

I. C. Andrews & Co., New York, Hamburg, 60 bags.

WOOD PULP

Atterbury Bros. Inc., Fred VIII, Oslo, 150 bls. sulphite, 25 tons; Castle & Overton Inc., West Eldara, Rotterdam, 1030 bls. wood pulp. 206 tons; Castle & Overton Inc., New York, Hamburg, 1395 bls. wood pulp, 279 tons.

WOOD FLOUR

The Burnet Co., Rotterdam, Rotterdam, 1500 bags.

PORTLAND, ME., IMPORTS

WEEK ENDING JULY 2, 1932

Gottesman & Co. Inc., Belos, Sweden, 7750 bls. wood pulp; Gottesman & Co. Inc., Trolleholm, Sweden, 4800 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING JULY 2, 1932

G. F. Malcolm, Britannic, Liverpool, 4 cs. tissue paper; Meredith Linen Mills, New Britain, Antwerp, 80 bls. flax waste; French Worsted Co., New Britain, Antwerp, 38 cs. paper tubes.

BALTIMORE IMPORTS

WEEK ENDING JULY 2, 1932

S. Shapiro & Sons, Tai Ping, Yokohama, 72 bls. rags; S. George, West Eldara, Rotterdam, 163 coils old rope; ——, West Eldara, 118 bls. bagging; Congoleum Nairn Co., Vincent, Havre, 98 bls. rags; Gottesman & Co. Inc., Belos, Sweden, 3250 bls. wood pulp; Parsons & Whittemore Inc., Talisman, ——, 300 bls. sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING JULY 2, 1932

J. Andersen & Co., Alberta, Trieste, 430 bls. wood pulp; Castle & Overton, Inc., Vincent, Havre, 66 bls. rags.

SAN FRANCISCO IMPORTS

WEEK ENDING JULY 2, 1932

S. Shapiro & Sons, Tai Ping, Yokohama, 48 bls. rags.

To Cease Use of the Word "Mills"

WASHINGTON, D. C., July 6, 1932—A paper distributor has entered into an agreement with the Federal Trade Commission in connection with the use of the word "mills". He will cease the use of this word in his advertising. The Commission does not make public the name of the firm but the agreement is as follows:

Respondent, an individual, engaged in the conversion, sale and distribution in interstate commerce of paper products, and in competition with other individuals, firms, partnerships and corporations likewise engaged in the sale and distribution in interstate commerce, entered into the following agreement to cease and desist forever from the alleged unfair methods of competition as set forth therein.

Respondent agreed to cease and desist forever from the use of the word "Mills" either independently or in connection with any other word or words, or in any way so as to import or imply, or which may have the capacity and tendency to confuse, mislead or deceive purchasers into the belief that said respondent owns, controls or operates a paper mill wherein his said products are manufactured, when such is not the fact.

Respondent also agreed that should he ever resume or indulge in any of the practices in question, this said stipulation as to the facts may be used in evidence against him in the trial of the complaint which the Commission may issue.

Trimbey Machine Works Busy

GLEN FALLS, N. Y., July 5, 1932—Orders from foreign countries are enabling the Trimbey Machine Works to maintain full time schedules. Work is now being rushed upon the construction of a metering system and two consistency regulators for a prominent paper concern in Italy and shipment will be made within the next few weeks. It was announced that the order would be forwarded to Rome prior to being shipped to its final destination. No difficulty is expected in shipment as the equipment is not exceptionally large.

It is claimed that one of the largest metering systems ever constructed was turned out early this month in the Canadian branch of the company. The order was for the Ontario Paper Company, of Thorld, Ont., and several consistency regulators were also produced for the same firm. The metering system is said to be capable of handling several hundred tons of the manufactured product daily.

During the past month two consistency regulators were made for the mills of J. R. Booth, Ltd., of Ottawa, and a pulp screen for a paper mill in Germany. The latter order was turned out in this city. An order calling for a metering system is also under construction now for a concern in France.

Stability of Hand-Made Papers

Tests of commercial hand-made book papers recently made by the Bureau of Standards, Washington, D. C. show that they have much the same range of stability of strength, under the heat test, as found in machine-made book papers.

Through the cooperation of a domestic dealer in such papers, 13 samples representative of the products of five different foreign countries were made available for the Bureau tests. The papers were tested for folding endurance before and after being subjected to a temperature of 100° C. for 72 hours.

EXTENSION MODEL

Cambridge Surface Pyrometer

is an instrument which applied to the surface of a dryer or calender roll, instantly indicates the exact surface temperature. Its use enables the operator to locate water logged rolls and to maintain every roll at the correct temperature for efficient progressive drying.

The instrument is compact, rugged and easy to read. The extension rod permits temperature checking across the entire roll. Scale ranges are 50-250° and 50-400° F.

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AMIJEL

The Modern Starch Beater Size — ready for immediate use — just add in dry form to beater.

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for every grade of

PULP AND PAPER

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Seamless felts for fast running.
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Send us your felt problems.

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protects your rolls and insures their delivery to your customer in perfect condition. They eliminate claims for damages.

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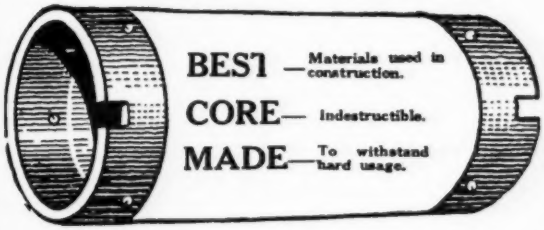

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Canadian Elixman Company
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New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, July 6, 1932.

Due to the prevailing holiday spirit, trading in the local paper market was only moderately active during the past week. Sales forces of the leading paper organizations relax their efforts to some extent at this time of the year. The outlook for the closing months of the year is considered fairly promising.

No radical changes have been reported in the news print paper market. Production in the United States, Canada and Newfoundland is being maintained in sufficient volume to take care of current requirements. Negotiations for consolidating the leading interests in Canada are still proceeding, although progress is slow.

The paper board market is practically marking time. Demand for box board is mostly routine. Prices generally remain unchanged. The fine paper market is exhibiting a fairly strong undertone. Coarse paper specialties are in good request and kraft wrapping paper is moving in satisfactory volume considering general conditions.

Mechanical Pulp

Since last week, no further price changes have been recorded in the ground wood market. The mechanical pulp industry is still in a sound statistical position, as production both at home and abroad continues to be curtailed, and accumulations are not excessive. Supplies are going forward to the paper mills fairly regularly.

Chemical Pulp

Conditions in the local chemical pulp market are fairly satisfactory. The continuation of the pulp mill workers' strike in Sweden continues an important factor in the general situation and is responsible for the firm tone of the industry. As usual at this time of the year the prevailing demand is light.

Old Rope and Bagging

The old rope market is fairly steady. Although demand for both domestic and imported old manila rope is light, quotations are well maintained, in most instances. Small mixed rope is moving in moderate volume. The bagging market is irregular. Gunny bagging is arousing a little interest, but scrap bagging is comparatively quiet.

Rags

What with the inventory period and the mid-summer holidays, the domestic rag market is somewhat listless at present. The various grades of cotton rags are moving slowly. Prices are strictly nominal. The imported rag market continues dull. New white cuttings are now offered at from 4.25 to 4.50 and new light oxfords at from 3.75 to 4.00.

Waste Paper

The paper stock market is rather spotty. Board mill demand for the lower grades has quietened down considerably, for the time being. Quotations, however, are generally steady and unchanged. Paper mill interest in the higher grades is also restricted. Book stock and shavings are quiet. Prices are practically unchanged, however.

Twine

Most of the business transacted in the local twine market during the past week was along routine lines. Sales of the various grades were said to be about equal to the volume booked in the corresponding period last year. Greater activity in the near future is confidentally anticipated, in some quarters. Prices remain unchanged.

Latex Research Laboratory

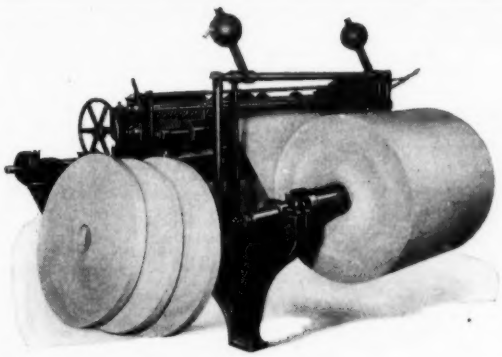
Special attention is now being given to the development of latex solutions for the paper laboratory in what is probably the first and only chemical laboratory of its kind. This laboratory was installed some time ago by Charles E. Wood, Inc., direct importers of crude rubber.

LATEX LABORATORY

60 per cent and 38 per cent liquid rubber latex, of 21 West street, New York City. The laboratory, which is located at 33-35th street, Brooklyn, N. Y., occupies several thousand feet of floor space and is completely equipped for all types of latex research and the development of latex materials and solutions.

Charles E. Wood, president, although actively engaged in the importation of crude rubber for the past 38 years, has been especially interested in latex since 1924. For several years, while on his annual trip abroad, Mr. Wood has taken the opportunity to observe the latest developments in latex technique and equipment as practiced in Germany and England. In designing his laboratory Mr. Wood has included all of the best features and equipment which have been observed in his travels.

In addition to his own investigators, Mr. Wood has retained George D. Kratz, consulting chemist of 250 West 57th street, New York City, as a consultant on latex problems. Mr. Kratz has a background of over 20 years experience in rubber and latex.



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Designed to meet the requirements of all users of Automatic Machines that take the stock from the roll, and require a roll of large diameter wound true and solid.

With this slitter, wide and narrow widths cut at the same time are of uniform tension. A roll slit and rewound 1" wide and 48" diameter can be handled without danger of spinning. At very little additional cost per ton paper mills equipped with this Slitter can furnish their customers with paper or board slit and rewound from 1" width and up. Made in three widths: 48"—60"—72".

INMAN MANUFACTURING COMPANY
AMSTERDAM, N. Y.

Manufacturers of
AUTOMATIC MACHINERY FOR PAPER BOXES AND ROTARY PAPER CUTTING MACHINERY

Sulphur

A FIRST REQUISITE

in

Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

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75 E. 45th Street New York City
Mines: Gulf, Newgulf and Long Point, Texas

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"HAFSLUND BEAR"
Bleached Sulphite

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"HURUM SPECIAL"
Extra Strong Kraft

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Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

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"READY DRESSED" **MILL COGS**

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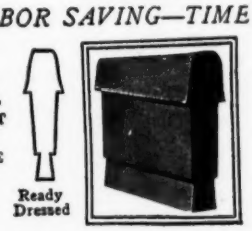

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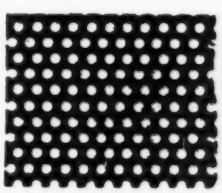
For Pulp and Paper Mills



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".065" Round

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Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, July 6, 1932.

BLANC FIXE.—Business in the blanc fixe market is moderately active. Prices remain unchanged. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The position of the bleaching powder market is practically unchanged. Shipments against contract are moving in fair volume. Prices are steady. Bleaching powder is quoted at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—The casein market continues quiet. Domestic standard ground is still quoted at 5 cents and finely ground at 6 cents per pound. Argentine standard ground is selling at 8 cents and finely ground at 8½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Trading in the caustic soda market is listless. Prices remain unchanged. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is fairly active. Contract shipments are moving in moderate volume. Imported china clay is quoted at from $10 to $15 per ton, ship side; while domestic paper making clay is selling at from $5 to $12 per ton, at mine.

CHLORINE.—Demand for chlorine is fairly persistent. The contract movement is well up to average. Prices are generally holding to schedule. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is dull. Prices are easier. The grades of gum rosin used in the paper mills are quoted at from $3.35 to $3.50 per 280 pounds, in barrels, at works. Wood rosin is selling at $2.50 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Paper mill demand for salt cake is restricted. Prices remain unaltered. Salt cake is quoted at from $15 to $16; chrome salt cake at from $12 to $13 per ton, in bulk, at works. Imported salt cake is selling at from $14 to $15 per ton, ship side.

SODA ASH.—The soda ash market is exhibiting a fairly steady undertone. Contract shipments are going forward with regularity. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.00; in bags, $1.25; and in barrels, $1.38.

STARCH.—Conditions in the starch market are fairly satisfactory. The contract movement is seasonal. Prices remain unchanged. Special paper making starch is quoted at $2.44 per 100 pounds, in bags; and at $2.71 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Steadiness prevails in the sulphate of alumina market. Prices are holding to formerly quoted levels. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues unchanged. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—No radical changes have been reported in the talc market of late. Prices remain steady. Domestic talc is still quoted at from $16 to $18 per ton, in bulk, at mine; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@38.00
Bonds	5.00	@53.25
Index	6.00	@12.00
Writings—		
Extra Superfine	6.50	@15.00
Superfine	6.25	@14.75
Tub sized	4.50	@ 7.00
Engine sized	4.00	@ 5.00
Book, Cased—		
S. & S. C.	5.25	@ —
M. F.	3.75	@ 5.00
Coated and Enamel	6.25	@ 9.75
Lithograph	6.75	@11.25
Tissues—Per Ream—		
White No. 1	.65	@ .70
Anti-Tarnish M. G. only	.65	@ .70
Colored	.70	@ .90
White No. 2	.50	@ .60
Kraft	.65	@ .70
Manila	.55	@ .60
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.00	@ 5.25
No. 2 Wood	3.50	@ 4.00
Butchers	3.37½	@ —
Fibre Papers—		
No. 1 Fibre	4.25	@ 5.50
No. 2 Fibre	4.00	@ 4.75
Common Bogus	1.50	@ 3.00
Screenings	2.00	@ 3.00
Card Middies	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs., No. 1	.09¼	@ —
No. 2	.11¼	@ —
Bleached, basis 20 lbs.	.11¼	@ —
(Delivered New York)		
News, per ton—		
Roll, contract	53.00	@ —
Rolls, spot	53.00	@ —
Sheets	58.00	@ —
Side Runs	38.00	@42.00
Kraft—		
No. 1 Domestic	4.75	@ 6.00
No. 2 Domestic	3.25	@ 4.00
Southern	3.25	@ 4.00
Imported	3.50	@ 4.30
Boards—per ton—		
News	24.00	@25.00
Straw	34.50	@45.00
Chip	24.00	@25.00
Binders' Boards	62.00	@70.00
Standard 85 Test Liner	30.00	@32.50
Sgl. Mla. Li. Chip	35.00	@37.50
(F. o. b. Mill)		
Wood Pulp Boards	70.00	@80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—		
Moist	19.00	@21.00
Dry	21.00	@22.00
(F. o. b. Mill)		
No. 1 Domestic	18.00	@24.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	2.10	@ 2.90
Easy Bleaching	1.60	@ 1.75
No. 1 strong unbleached	1.50	@ 1.65
Mitscherlich unbleached	1.60	@ 1.75
No. 2 strong unbleached	1.25	@ 1.35
No. 1 Kraft	1.50	@ 1.65
No. 2 Kraft	1.35	@ 1.40
Sulphate—		
Bleached	1.85	@ 2.15
(F. o. b. Pulp Mill)		
Sulphite (Domestic and Canadian)—		
Bleached	2.10	@ 3.75
Easy Bleaching	1.75	@ 1.90
News	1.50	@ 1.65
Mitscherlich	2.40	@ 2.55
Kraft (Domestic)	1.50	@ 2.75
(Delivered Paper Mills)		
Soda Bleached	2.25	@ —

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	4.00	@ 4.25
New White, No. 2	3.00	@ 3.25
Silesias No. 1	3.75	@ 4.00
New Unbleached	5.50	@ 6.00
New Soft Blacks	2.75	@ 3.00
Blue Overall	3.00	@ 3.50
Fancy	1.50	@ 1.75
Washables	1.15	@ 1.40
Mixed Khaki Cuttings	2.50	@ 3.00
Pink Corset Cuttings	2.75	@ 3.25
O. D. Khaki Cuttings	3.00	@ 3.25
Men's Corduroy	1.00	@ 1.25
New Mixed Blacks	2.25	@ 2.50

Old Rags

White, No. 1—		
Repacked	3.00	@ 3.50
Miscellaneous	2.00	@ 2.25
White, No. 2—		
Repacked	1.75	@ 2.00
Miscellaneous	1.50	@ 1.75
Thirds and Blues—		
Repacked	1.50	@ 1.75
Miscellaneous	1.00	@ 1.25
Black Stockings	2.00	@ 2.25
Roofing Rags—		
No. 1	.53	@ .58
No. 2	.48	@ .53
No. 3	.43	@ .48
No. 4	.38	@ .43
No. 5A	.33	@ .38

Foreign Rags

New Rags

New Dark Cuttings	1.40	@ 1.50
New Mixed Cuttings	1.60	@ 1.75
New Light Silesias	3.40	@ 3.50
Light Flannelettes	3.25	@ 3.50
Unbleached Cuttings	5.50	@ 6.00
New White Cuttings	4.25	@ 4.50
New Light Oxfords	3.75	@ 4.00
New Light Prints	2.00	@ 2.25

Old Rags

No. 1 White Linens	5.25	@ 5.50
No. 2 White Linens	4.50	@ 4.75
No. 3 White Linens	3.25	@ 3.75
No. 4 White Linens	1.75	@ 2.25
No. 1 White Cotton	4.00	@ 4.25
No. 2 White Cotton	3.00	@ 3.25
No. 3 White Cotton	2.25	@ 2.50
No. 4 White Cotton	1.40	@ 1.50
Extra Light Prints	1.90	@ 2.10
Ord. Light Prints	1.60	@ 1.75
Med. Light Prints	1.40	@ 1.55
Dutch Blue Cottons	1.35	@ 1.40
French Blue Linens	1.80	@ 1.90
German Blue Linens	1.70	@ 1.80
German Blue Cottons	1.20	@ 1.25
Checks and Blues	1.25	@ 1.30
Lindsay Garments	.75	@ .80
Dark Cottons	.70	@ .75
Old Shopperies	.55	@ .60
New Shopperies	.60	@ .65
French Blues	1.25	@ 1.30

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.00	@ 1.10
Domestic	1.15	@ 1.25
Wool Tares, light	.80	@ .85
Wool Tares, heavy	.80	@ .85
Bright Bagging	.75	@ .80
Small Mixed Rope	.80	@ .90
Manila Rope—		
Foreign	1.50	@ 1.60
Domestic	1.50	@ 1.75
New Burlap Cut	1.65	@ 1.75
Hessian Jute Threads—		
Foreign	2.60	@ 2.75
Domestic	2.80	@ 3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	2.00	@ 2.15
Hard, white, No. 2	1.40	@ 1.50
Soft, white, No. 1	1.30	@ 1.40
White envelope cuttings	1.60	@ 1.70
Flat Stock—		
Stitchless	.65	@ .70
Overissue Mag.	.65	@ .70
Solid Flat Book	.55	@ .60
Crumpled No. 1	.40	@ .45
Solid Book Ledger	1.50	@ 1.75
Ledger Stock	.60	@ .70
New B. B. Chips	.20	@ .30
Manilas—		
New Env. Cut	1.30	@ 1.40
New Cuttings	1.05	@ 1.15
Extra No. 1 old	.90	@ 1.00
Print	.40	@ .45
Bogus Wrapper	.40	@ .45
Container	.25	@ .30
Old Kraft Machine—		
Compressed bales	.75	@ .85
News—		
No. 1 White News	1.25	@ 1.35
Strictly Overissue	.35	@ .45
Strictly Folded	.25	@ .30
No. 1 Mixed Paper	.15	@ .20

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Dependable, uniform paper-making chemicals can only be made by quantity production under strict chemical control.

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KALAMAZOO, MICHIGAN

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a sure cut
a shear cut

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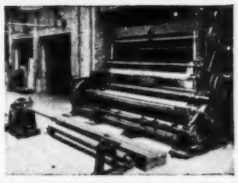

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CHICAGO

Twines
(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finisned Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 P—			
No. 1	.15½	@	.16½
No. 2	.11¾	@	.12¾
Tube Rope—			
4-ply and larger	.9½	@	.11¼
Fine Tube Rope—			
4-ply	.11	@	—
3-ply	.12	@	—
2-ply	.13	@	—
Paper Makers Twine			
Balls	.08¾	@	.10¼
Box Twine, 2-3 ply	.07	@	.08
Jute Rope	.09	@	.10
Amer. Hemp, 6	.27	@	.29
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.23	@	.28

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.04	@	.11
Supernne Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.18
No. 1 M. F. Book	.06½	@	.07½
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05½
No. 1 Fibre	.04¼	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.50	@	5.00
Southern Kraft	3.25	@	—
No. 2 Kraft	3.25	@	—
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07½
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	53.00	@	—
Sheets	58.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.75	@	1.80
No. 1 Hard White	1.55	@	1.60
No. 1 Soft White	1.40	@	1.45
Ledger & Writings	.55	@	.65
Solid Books	.50	@	.55
Blanks	1.15	@	1.20
Krafts	.95	@	1.00
New Kraft Cuts	1.40	@	1.50
Manila Env. Cuts	1.40	@	1.50
Ex. No. 1 Manila	1.00	@	1.10
Print Manila	.35	@	.40
Overissue News	.45	@	.55
Old Newspapers—			
No. 1	.45	@	.50
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.25	@	.30
No. 2	.15	@	.20
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.09
Manila Sul., No. 1	.03	@	.05
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.04
Southern Kraft No. 2	—	@	.03¾
Common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	58.00	@	62.00
Straw Board	50.00	@	—
News Board	30.00	@	32.00
Chip Board	25.00	@	27.50
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	73.00	@	75.00
No. 2, per ton	63.00	@	65.00
Carload lots	62.00	@	67.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.05	@	.05½
New Whitie, No. 2.	.04	@	.04¼
Light Silesias	.04	@	.04½
Silesias, No. 1	.04	@	.04½
Black Silesias, soft.	.04	@	—
New Unbleached	.05½	@	.06
Washable, No. 1	.02	@	.02½
Blue Overall	.04	@	.04½
Cottons—According to grades—			
Washable, No. 2	.01½	@	.02
New Blue	.01¾	@	.02
Fancy	.02	@	—
New Black Soft	.02	@	.03
New Light Seconds	.01¾	@	.02
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O.D.	.04½	@	.05
No. 2 Mixed	.03½	@	.04
Corduroy	.02½	@	.03
New Canvas	.06½	@	.07
New Black Mixed.	.02½	@	.03

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	2.50
M. G.	3.50	@	4.00
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	3.00	@	3.50
Roofing Stock—			
Foreign No. 1	1.00	@	1.10
Repacked	.70	@	.80

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	—
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	1.90	@	2.00
No. 2 Hard White	1.75	@	1.80
No. 1 Soft White	1.60	@	1.70
No. 2 Soft White	1.40	@	1.50
No. 1 Mixed	.45	@	.55
No. 2 Mixed	.40	@	.50
Solid Ledger Stock	1.00	@	1.10
Writing Paper	.80	@	.90
No. 1 Books, heavy	.55	@	—
No. 2 Books, light	.40	@	—
No. 1 New Manila	1.25	@	1.50
No. 1 Old Manila	1.00	@	1.25
Print Manila	.40	@	—
Container Manila	.40	@	.45
Old Kraft	.90	@	1.00
Common Paper	.15	@	.20
No. 1 Mixed Paper	.20	@	.25
Straw Board, Chip	.25	@	.35
Binders Board, Chip	.25	@	.35
Corrugated Board	.30	@	.35
Overissue News	.40	@	.45
Old Newspaper	.20	@	.25

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05½	@	.11¼
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08¼
Book, Coated	.08¼	@	.18
Coated Litho	.09	@	.12
Label	.09¼	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06¼
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04½	@	.05½
No. 2 Kraft	.03¼	@	.03½
(F. o. b. Boston)			
Southern Kraft	.03¼	@	.03½
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print, rolls	—	@	52.50
Straw Board, rolls.009	—	@	35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	25.00	@	30.00
Chip Board	—	@	25.00
Chip Board (Creasing)	25.00	@	27.50
Single Manila Lined Chip	—	@	35.00
Single White, Patent Coated News Board—			
Binder	45.00	@	55.00
Wood Pulp Board	70.00	@	75.00
Binder Boards	62.00	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Soft White	—	@	1.35
No. 1 Old Manila	.65	@	.75
No. 2 Mixed	.50	@	.55
No. 1 Mixed	.75	@	.85
Solid Ledger Books	1.30	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.90	@	1.10
No. 1 Books, heavy	.60	@	.70
No. 1 Books, light	—	@	.45
Crumpled Stitchless Book Stock	1.00	@	1.25
Manila Env. Cuttings	1.50	@	1.60
No. 1 Old Manila	.80	@	.90
White Blank News	1.10	@	1.20
Kraft No. 1	.70	@	.80
Manila	.80	@	.90
No. 1 Mixed Papers	.12½	@	.15
Print Manila	.30	@	.40
Overissue News	.35	@	.45
Old Newspapers	.22½	@	—
Box Board, Chip	.17½	@	.20
Corrugated Boxes	.17½	@	.22½
Screening Wrappers	.25	@	.32½

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.00
Domestic	.75	@	.80
Manila Rope—			
Foreign	1.50	@	1.60
Domestic	1.55	@	1.75
Transmission Rope	1.00	@	—
Mixed String	—	@	.32½
Jute Rope	—	@	.75
Jute Carpet Threads	.25	@	.30
Bleachery Burlap	1.75	@	2.00
Scrap Burlap	.50	@	.55
No. 1 Scrap Burlap	.80	@	.90
Scrap Sisal	.60	@	.75
Scrap Sisal for shredding	.90	@	1.00
Wool Tares, heavy	.60	@	.65
New Burlap Cutting	.75	@	.90
Australian Wool Pouches	1.25	@	1.50
Heavy Baling Bagging	1.00	@	1.25
Paper Mill Bagging	.60	@	.70
Bagging No. 2	.20	@	.25
No. 1 Burlap	2.75	@	3.00

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	—	@	.01½
New White No. 1	.04	@	.04½
New White No. 2	.03	@	.03¾
Silesias No. 1	—	@	.03
New Black Silesias	.02½	@	.02¾
New Unbleached	.05	@	.05¼
Fancy	—	@	.02½
Washable	—	@	.01¾
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.03	@	.03½
O. D. Khaki	.03½	@	.03¾
Corduroy	.02¾	@	.03
New Canvas	—	@	.05
B.V.D. Cuttings	.04	@	.04¼

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	2.25
White No. 2—			
Repacked	.02¼	@	.02½
Miscellaneous	.02	@	.02¼
Twos and Blues	.90	@	1.00
Thirds and Blues—			
Repacked	.75	@	.85
Miscellaneous	.70	@	.75
Black Stockings	2.00	@	2.25
Roofing Stock—			
No. 1	.35	@	.40
No. 2	.30	@	.35
No. 3	.25	@	.30

Foreign Rags
(F. o. b. Boston)

Dark Cottons	.40	@	.50
New No. 1 White Shirt Cuttings	3.75	@	4.00
Dutch Blues	1.25	@	1.50
New Checks & Blues	2.25	@	2.50
Old Fustians	—	@	.85
Old Linsey Garments	.55	@	.65

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¼	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.10¾	@	
No. 2 Colored	.09	@	.10¼
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (Carloads)	6.65	@	—
No. 3 M. F. (Carloads)	6.20	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.40	@	—
White Wrap	3.00	@	—
"B" Manila	4.90	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.40	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	52.50	@	53.00
Sheets	57.50	@	—

Pulp
(F. o. b. Mill)

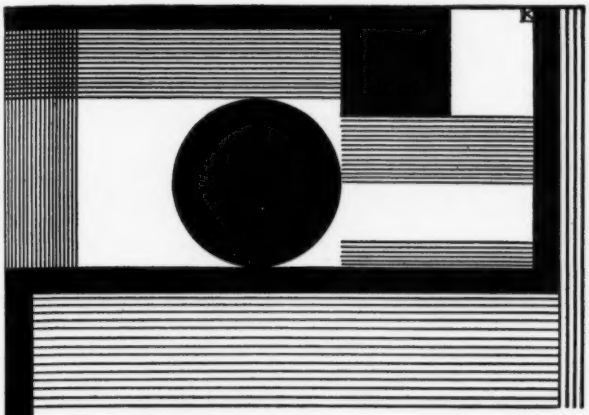
Ground Wood	30.00	@	32.00
Sulphite easy bleaching	45.00	@	—
Sulphite, news grade	40.00	@	—
Sulphite, bleached	58.00	@	65.00
Sulphate	55.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.50	@	—
Soft White	2.25	@	—
White Blk. News	1.50	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	—
Light and Crumpled Book Stock	.80	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.65	@	—
Kraft	1.75	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06¼



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THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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